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LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

REPORT

OF THE

DIRECTOR-GENERAL OF PUBLIC HEALTH,

NEW SOUTH WALES,

FOR THE YEAR 1926

Ordered by the Legislative Assembly to be printed, 8 *December*, 1927.

SYDNEY: ALFRED JAMES KENT, GOVERNMENT PRINTER.

1928.

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LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

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Offices of the Director-General of Public Health, 93 Macquarie-street, Sydney.

Legislative Enactments.

The Minister of Public Health is charged with the administration of the Acts noted hereunder, execution of which is left to the Director-General of Public Health and the staff working under his control:—

Cattle Slaughtering and Diseased Animals and Meat Act, 1902.
Dairies Supervision Act, 1901.
Diseased Animals and Meat (Amendment) Act, 1910.
Food Preservation by Sulphur Dioxide Enabling Act, 1920.
Noxious Trades Act, 1902.
Nurses Registration Act, 1924.
Private Hospitals Act, 1908.
Public Health Act, 1902.
Public Health (Amendment) Act, 1915.
Public Health (Amendment) Act, 1921.
Public Health (Night-soil Removal) Act, 1902.
Pure Food Act, 1908.
Venereal Diseases Act, 1918.
Closed Cemeteries and Exhumation of Bodies for the purpose of re-interment, &c.

Branches and Institutions controlled by the Director-General of Public Health :—

Executive and Clerical Staffs.
Epidemic and Sanitary Inspectorial Branches.
Microbiological Laboratory.
Chemical Laboratory.
Pure Food Branch.
Dairies Supervision and Cattle Slaughtering Inspection Branches.
Government Medical Officers for Sydney.
Industrial Hygiene.
Maternal and Baby Welfare.

State Hospitals and Asylums, Convalescent Homes, and Sanatoria, including :—

Coast Hospital, for General and Infectious Cases.
Leper Lazaret.
David Berry (General) Hospital.
Montrose Maternity Hospital, Burwood.
Fernleigh Rest Home (Pre- and Post-Maternity), Ashfield.
Lady Edeline Hospital for Babies, "Greycliffe," Vaucluse.
Strickland Convalescent Home for Women, "Carrara," Rose Bay.
Denistone Convalescent Home for Men, Eastwood.
Waterfall Sanatorium for Consumptives.
Rookwood State Hospital and Asylum (Men).
Liverpool State Hospital and Asylum (Men).
Newington State Hospital and Asylum (Women).

Parramatta Homes :—
  (*a*) Macquarie-street Asylum for the Blind, and for Men suffering from Defective Sight and Senility.
  (*b*) George-street Asylum for Aged and Infirm Men.

Members of the Board of Health.

Dick, Robert, M.B., Ch.M., D.P.H.,	Director-General of Public Health (President).
Paton, Robert Thomson, C.M.G., F.R.C.S., Edin., M.D. Brux.,	Member, Board of Health.
Robinson, Augustus Frederick	Member, Board of Health.
Purser, Cecil, M.B., Ch.M.	do do
Chairman, Chamber of Commerce	do do (*ex officio*).
The Right. Hon. the Lord Mayor	do do (*ex officio*).
Fegan, The Hon. J. L., to 30/9/1926; succeeded by Plunkett, J. G., from 1/10/1926	do do
Armstrong, Wm. George, M.B., D.P.H.,	do do
Wall, The Hon. Frank Edgar, M.D., M.L.C.	do do
Maincke, Mrs. Euphemia Jean	do do

Head Office Staff.

Dick, Robert, M.B., Ch.M., D.P.H.	Director-General of Public Health.
Morris, E. S., M.D., Ch.M., D.P.H.	Senior Medical Officer of Health and Director of Maternal and Baby Welfare.
Purdy, John Smith, M.D., D.P.H.	Medical Officer of Health, Metropolitan Combined Districts.
Wallace, H. G., M.B., B.S., D.P.H.	Medical Officer of Health, Hunter River Districts.
Suckling, Frank Martin, M.B., D.P.H.	Assistant Medical Officer of Health.
Palmer, Arthur Aubrey, M.B., Ch.M.	First Government Medical Officer for Sydney.
Gibbes, Alexander Edward, M.B., Ch.M.	Second do do
Mackay, Robert Mitchell, M.D.	Third do do
Badham, Charles, B.Sc., M.B., Ch.M. D.P.H.	Medical Officer of Industrial Hygiene.
Tooth, Frederick, M.R.C.S., L.R.C.P., D.P.H., R.C.P.S.	Medical Officer.
Thompson, Roy William, M.B., Ch.M., D.P.H.	Acting Assistant Medical Officer.
Neely, Thomas Henry	Secretary.
Potter, James Julius	Chief Clerk.
Street, Cleveland Snelling	Accountant.
White, Adolphus George	Publicity Officer.
Boyle, John James Valentine	Acting Inspector of Hospitals.

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REPORT of the Director-General of Public Health to the Honorable the Minister of Public Health.

Sir,

I have the honor to append hereto the reports for 1926 of the various branches and institutions under my charge. The year has been one of strenuous routine work, accompanied by satisfactory progress in several important directions, particularly the organisation of Maternal and Baby Welfare work, the co-ordination of tuberculosis activities, and the establishment of a Nurses' Registration Board for regulation of this important adjunct of public health work.

Vital Statistics.—The Government Statistician's review of the year's statistics is included on p. 13. The population of New South Wales at the end of 1926 was 2,349,401 (males 1,197,428, females 1,151,973), an increase over 1925 of 49,320, of which 30,938 was due to the excess of births over deaths, and 18,382 to the excess of arrivals over departures. The death rate was 9·56 per 1,000 of the population, and is 2·8 per cent above the average of the previous five years. The infant death rate was equal to 57·6 per 1,000 births, and although higher than the rate for 1925 (54·9) was 1·4 per cent. below the average of the previous five years. Of the deaths under one year of age, 1,288 or 42 per cent. occurred under one week; 1,635, or 53 per cent., under one month; and 1,985, or 65 per cent., under three months.

The statistics for the Metropolitan Combined Sanitary District and the Hunter River Combined Sanitary District are carefully reviewed by the Medical Officers of Health for those districts on pp. 78 and 96.

CHEMICAL LABORATORY (GOVERNMENT ANALYST, DR. THOMAS COOKSEY, Report p. 16).

The work of this branch includes the analysis of food and drug samples submitted by pure food inspectors for examination as to conformity with standards, compliance with labelling provisions, wholesomeness, and freedom from contamination of ingredients used in manufacture, and evidence of deterioration, &c.

In 1926, 19,673 samples were examined; 15,921 samples consisted of milk, 3 per cent. of which were found to be adulterated. The lowest previous record of adulteration was 3·2 per cent. in 1925. It will be seen from Dr. Cooksey's report that a considerably higher proportion of adulterations was found in milk samples from country districts than in those from the metropolitan area, the figures being :—Country : 2,424 samples, adulterated 5 per cent.; Metropolitan : 13,497 samples, adulterated 2·64 per cent. A table is given in the report showing for each month the samples deficient in milk fat, and in solids not fat.

In foods other than milk, the most persistent form of adulteration was found to be the use of sulphurous acid for preserving fresh meat. Over 80 per cent. of the meat samples examined were found to contravene the regulations. The use of any preservative substance in fresh meat (other than sausage meat) is forbidden.

Medico-legal Examinations.—The police submitted 302 exhibits connected with criminal investigations; and 56 examinations (human viscera, 52; blood, 4) were made at the coroner's request in connection with uncertified deaths. Twelve deaths were found to be due to strychnine, two each to prussic acid and morphine, and one each to cocaine, paraldehyde, barbitone (veronal), barium and nicotine. In the latter case the deceased masticated and swallowed enough cigarettes to cause death.

Conference of Federal and State Analysts.—The first conference of analysts was held in Sydney in January, the object of the conference being to secure uniformity of the Pure Food laws and regulations throughout the Commonwealth, and standardisation of methods of analysis.

PURE FOOD BRANCH (CHIEF INSPECTOR MR. ARTHUR KENCH, Report p. 21).

This staff is charged with supervision throughout the State of all places where food and drugs are prepared, stored or exposed for sale. 11,370 premises were inspected in various parts of the State. In 1926 special attention was given to the bread supply, and several bakeries were remodelled under supervision of departmental officers.

Five hundred prosecutions were instituted by officers of this branch in connection with sale of adulterated or deteriorated foods, unclean premises, &c., the fines imposed amounting to £1,785.

DAIRIES SUPERVISION ACT, 1901, AND CATTLE SLAUGHTERING AND DISEASED ANIMALS AND MEAT ACT, 1902 (CHIEF DAIRY INSPECTOR, MR. T. V. BLOMFIELD, Report p. 25).

Mr. Blomfield reports that at the end of 1926, there were 21,634 registered dairymen and 6,360 milk vendors. Dairy cattle totalled 921,445. Of 399,164 dairy cattle inspected by this staff, 475 were condemned for tuberculosis, 131 for actinomycosis, 96 for cancer, and 10 for other diseases.

SANITATION (CHIEF SANITARY INSPECTOR MR. E. A. CRESSWICK, Report p. 26).

A resumé is given by Mr. Cresswick of the general and routine work carried out by this Branch. At the Homebush Abattoirs the methods adopted for treatment of slaughterhouse wastes appear to be working smoothly, as comparatively few complaints were received from residents of the western suburbs during the year.

Attention is drawn by Mr. Cresswick to the advisability of making it mandatory on local authorities to provide a water supply for towns with populations of over 1,000, and sewerage for towns of over 2,000, provided such installations are reported by a qualified engineer to be reasonably practicable. In New South Wales there are ninety-five towns of over 1,000 persons without a public water supply and ninety-one towns of over 2,000 persons without sewerage.

Second-hand Bedding.—In October regulations in reference to rags, flock, and bedding, &c., were gazetted (see p. 28), and tests are in progress to ascertain the most satisfactory type of apparatus for treating second-hand materials.

Noxious Trades.—Investigation is being made into the desirability of setting aside an area some distance outside the metropolis for businesses licensed under the Noxious Trades Act. In recent years dry rendering plants have been installed at several premises, with satisfactory results in preventing nuisance from offensive odours.

POLLUTION OF RIVERS AND WATERCOURSES BY EFFLUENTS FROM INDUSTRIAL WORKS.

The increase in the number of manufacturing works is making it necessary that inspections should be frequently carried out to prevent offensive conditions arising. As mentioned in my report for 1925, an inter-departmental committee was appointed late in that year to investigate the causes of pollution, particularly in regard to the Parramatta River and the foreshores of Sydney Harbour, and formulate methods for preventing nuisance. This committee presented two interim reports and a final report in which recommendations to prevent pollution of the Parramatta River and Harbour of Port Jackson were made. These recommendations are receiving consideration by the Government.

PRIVATE HOSPITALS ACT, 1908—REPORT (p. 29) BY DR. F. M. SUCKLING.

At the end of 1926 there were 637 licensed hospitals, of which 263 (2,788 beds) were in the Metropolitan area, and 374 (2,377 beds) in country districts. Lying-in hospitals comprise 57 per cent. of the total premises licensed under this Act.

Ten cases of sepsis connected with pregnancy were reported, seven of which were from private hospitals in the metropolitan area. These cases were all made the subject of special inquiry. Delivery was instrumental in only one of the cases.

The question of a regulation for fixing the size and cubic capacity of rooms in private hospitals came under consideration during the year, and the Board of Health decided to adhere to its minimum requirement of 1,000 cubic feet per patient as a working basis in recommending issue of licenses. The question arose in connection with the provisions of Local Government Ordinance 70, which permit a habitable room in a dwelling to have a floor area of not less than 80 square feet and a height of not less than 9 feet.

The Nurses Registration Act will have some effect on administration of the Private Hospitals Act; as a case in point, two licensees of private hospitals who failed to obtain State registration are ineligible for approval as resident managers of private hospitals. Other effects of the new Act in respect of supervision over private hospitals will probably become apparent during 1927.

NURSES REGISTRATION ACT, 1924.

The Nurses' Registration Act became operative on 1st January, 1926 : A separate report is issued by the Nurses' Registration Board.

VENEREAL DISEASES ACT, 1918.

The sixth Report of the Commissioner (p. 43) shows that 6,001 notifications of venereal diseases were received in 1926, an increase of 687 on the number notified in 1925.

In the notified cases of syphilis (1,179 cases in 1926 and 1,015 in 1925) the proportion of males to females suffering from this disease remained practically the same as in previous years, being 3·55 to 1 in 1926, compared with an average of 3 to 1 for former years. The notifications for gonorrhoea (4,491 in 1926, compared with 3,933 for 1925) showed an increased ratio for females. The ratio in 1926 was 7·84 males to 1 female; for the three previous years the ratios were :—1923, 10·7 to 1; 1924, 9·17 to 1; 1925, 10·27 to 1.

No trustworthy inference can be drawn from these variations, chiefly owing to the fact that the notification of venereal diseases is neither thorough nor universal; the difficulties in the way of obtaining accurate statistics are drawn attention to in the report.

NOTIFIABLE DISEASES.

Typhoid Fever (*including paratyphoid*).—In 1926 there were 698 notified cases of typhoid fever and 80 deaths, as compared with 533 cases and 80 deaths in 1925, the year of lowest typhoid incidence since the introduction of notification in 1898. From Broken Hill, an endemic centre, 93 cases were notified in 1926. Dr. Ferguson, who inquired into the prevalence of typhoid fever at Broken Hill in 1925, concluded that the occurrence of cases there was probably due to defective sanitation, which allowed access of flies to infected material. No evidence was found by him to incriminate either the milk or water supplies. The seasonal prevalence of typhoid fever at Broken Hill corresponds well with the season of greatest fly prevalence.

Two outbreaks which occurred in Goulburn Gaol are reported upon by the Acting Principal Microbiologist (p. 146). The first outbreak (8th February, 1926–27th March, 1926) consisted of 18 cases, with 1 death; and the second outbreak (18th December, 1926–1st February, 1927) of 7 cases, with 2 deaths.

There were two outbreaks in the metropolitan district; these are reported upon by Dr. Purdy (p 87). The first outbreak (5 cases) was associated with an old well in the Ryde district. In the second outbreak, 43 residents of Hunters Hill, Lane Cove and Ryde municipalities were attacked, and one died.

Forty-one of the patients were supplied with milk by one dairy. Bacteriological examinations were made in connection with the milkers, carters and members of the dairymen's family, and yielded negative results; two employees who had left the dairy immediately prior to the outbreak could not be traced.

Anti-typhoid Inoculation.—The use of anti-typhoid inoculation at Broken Hill has been urged by the department from time to time, without result. The report on page 149 showing a reduction of more than 75 per cent. in the typhoid fever rate at Forbes following the use of biennial anti-typhoid inoculation since 1914 is of interest.

Scarlet Fever.—After a break of about 10 years scarlet fever has shown a tendency to recur in epidemic form, especially in the metropolitan district. In 1926, 4,755 cases and 53 deaths were notified, in comparison with a yearly average of 2,260 cases and 18 deaths for the previous five years. At the Coast Hospital 1,557 cases were treated, of whom 38 died, showing the unusually heavy mortality of 2·4 per cent. The graph (p. 42) shows the yearly fluctuations since the disease was made notifiable in 1898. Material was secured from the Commonwealth Serum Laboratories at the end of 1926 for carrying out the Dick Test. 227 children at one of the Newcastle institutions were tested, and 87 (38·3 per cent.) showed a positive reaction. An antitoxin received from the Commonwealth Laboratories for treatment is reported to reduce considerably the severity and length of an attack, but, owing to shortage of staff, tests could not be made before the end of the year.

Diphtheria,—3,570 cases of diphtheria were notified in 1926, an increase of 566 cases on the number (3,004) in 1925.

Schick Test.—The testing of children for susceptibility to diphtheria, begun in 1923, was continued in 1926 whenever circumstances permitted. 904 children in various parts of the State were tested, and 287 showed a positive reaction. Material for immunisation of susceptible children is supplied by this department free of charge, subject to arrangements being made by local authorities or parents for the injections.

Reorganisation of this work has become necessary for two reasons. Hitherto Schick tests, except in the Newcastle district, have been carried out by medical officers attached to the Microbiological Laboratory. It is found, however, that absence of these officers in the country for a week or more at a time dislocates and seriously hampers the main work of the branch. The second reason is the apathy shown by parents in having susceptible children immunised. To conduct a country campaign entails considerable expense and inconvenience, both departmental and personal. Officers are compelled to spend a couple of nights in train travelling, and to be absent from their homes for a week or more. Three or four hundred children are tested, of whom, on an average, 20 to 30 per cent. show a positive reaction. It is from this stage that the campaign fails to achieve results at all commensurate with the time and labour expended. Lithgow may be cited as an instance of the failure of parents to realise the importance of immunisation. This district was visited at the request of the local authority, and 366 children were tested, but consents were received to immunise only 17 of the 79 children found to be susceptible.

The Schick test is merely a safe and convenient method of determining whether a child is likely to become infected with diphtheria. Children showing a positive reaction should undoubtedly receive injections of toxin antitoxin, which gives protection against diphtheria for several years, possibly for life.

Another important aspect is that the campaign in this State has not reached the children most in need of protection, namely, those under school age, although the death-rate from diphtheria in the group under six years of age is about four times that of children between the ages of 6 and 14 years. The occurrence of diphtheria in a community could be almost eliminated if all children under 6 or 7 years of age were immunised without being subjected to a preliminary Schick test.

Incidence in the Metropolitan District.—There is a further important aspect. 53 per cent. of the notified cases of diphtheria in 1926 occurred in the metropolitan district. In that district there are more than 200,000 children of school age. The table on page 152 shows that up to the present time no interest in diphtheria immunisation has been taken by the schools or local authorities in the metropolitan area, the tests so far applied being mainly in country districts.

Division of Maternal and Baby Welfare: Appointment of a Medical Director.

Dr. Sydney Morris was appointed as Director of Maternal and Baby Welfare in April, and arrangements were made for transfer of control of the Baby Health Centres to the Office of the Director-General of Public Health from 1st May, 1926. Reorganisation of the division was actively proceeded with, and before the end of the year every Baby Health Centre in the State had been visited, including the four centres at Broken Hill.

During the journey to Broken Hill an investigation was made of the organisation of Baby Health work in Adelaide and Melbourne, and subsequently Brisbane was visited by the Director for the purpose of inquiring into health and baby welfare work in Queensland.

Ten additional Baby Health Centres were opened in 1926, and at the end of the year 60 centres were in operation, 36 of which were in the metropolitan area, 15 in the Hunter River (Newcastle) district, 4 at Broken Hill, and 1 each at Bathurst, Lithgow, Wagga, Culcairn, and Henty.

Wollongong, Goulburn, and other large towns were visited with the object of persuading local authorities to take an interest in the establishment of a local centre. In many instances active co-operation has resulted from such visits. The Department finds the most satisfactory plan is for the local committee to pay the rent of suitable premises and help towards equipping the centre. The staff is always appointed and paid by the Department to avoid any question arising as to discipline or the nature of the instructions to be given. The centres are staffed by fully-trained nurses, who in many instances are also certified midwifery nurses. They also undergo a special training at the Tressillian Mothercraft Training School before taking up Baby Welfare work in the centres. About ninety nurses are continuously employed in this work.

The essential purpose of the centres is to impress on mothers the importance of natural or breast feeding, and to afford mothers and expectant mothers the instruction in mothercraft which makes for the successful rearing of healthy and happy children. *Of every five infants who die during the first year of life four are artificially fed.* Every child has a right to be as healthy as human knowledge can make it. Under the complex circumstances of modern community life it is found that the maternal instinct alone is not sufficient equipment for the proper feeding and rearing of babies, but that mothercraft training must be added. A recent writer remarks that "for every big job in the world men and women train themselves, and yet allow themselves to know far too little about the biggest and best job of all—that of being the right kind of mother or father." Mothers in every grade of life are welcomed at the centres, for every healthy baby is equally one of the State's best assets, and any mother may need mothercraft instruction and guidance.

In 1926 there were 210,000 attendances at the centres, and 90,000 visits were made to mothers at their homes.

In districts where centres have been established, about 70 per cent. of the mothers regularly attend with their babies. In a recent investigation in the metropolitan district, it was found that over 70 per cent. of the cases of infantile gastro-enteritic infection and allied conditions admitted to the Royal Alexandra Hospital for Children occurred among the 30 per cent. of babies who did not attend the centres.

The exact position can be seen from the following tabulation :—

Total number of babies treated at Royal Alexandra Hospital for Children	171	
Never visited a Baby Health Centre	113	121 = 70·8 per cent.
Visited once when baby ill, and sent immediately to hospital	8	
Attended regularly		
Delicate or ill from birth	6	20 = 11·7 per cent.
Neglected, bad mothering, inability of mother to follow instructions, weaned against advice, &c.	7	
Wholly breast fed	4	
Not otherwise specified	3	
Attended irregularly :—		
Neglected, bad mothering, inability of mother to follow instructions, weaned unnecessarily, or against advice	10	30 = 17·5 per cent.
Two visits to Baby Health Centre	6	
Three visits to Baby Health Centre	3	
Four visits to Baby Health Centre	4	
Five visits to Baby Health Centre	2	
Seven visits to Baby Health Centre	1	
Number of visits not ascertained	4	

It is evident, considering the large proportion of the total babies who are brought regularly to the centres, that the incidence of the killing diseases is not among them, but among the babies who do not attend at all, or attend only at irregular intervals. One would be almost justified by this investigation in asserting that regular attendance at the Baby Health Centre is the best insurance for the safeguarding of the health of the infant.

It is the refractory section of mothers who cannot or will not avail themselves of the guidance and instruction afforded at the Baby Health Centres, who, in large measure, tend to maintain the present infant mortality rates.

Almost precisely similar results were obtained as the result of inquiry into infantile deaths at Broken Hill during the years 1924 and 1925.

Every infant death recorded by the Registrar was checked through the records of the local Baby Health Centres. It was ascertained that 70 per cent. of such infants had never attended, or their parents had refused to bring them under the influence of the Baby Health Centres. Since over 60 per cent. of the total babies in Broken Hill during the periods under consideration were attending the Baby Health Centres, it can readily be appreciated that the mortality arises not from the larger, but from the smaller section.

This evidence should suffice, if such evidence be necessary, to show the value of the Baby Health Centres in safeguarding infant life, and should be a conclusive argument against the misconceptions and prejudice which have surrounded the movement, but which are now, happily, declining.

The only method of overcoming this dangerous passive indifference is by educational propaganda, so that mothers who are apathetic, chiefly from ignorance, will be made to realise their responsibilities.

Publicity regarding the work of the Baby Health Centres is an essential part of a national campaign to reduce maternal and infantile mortality, and by such a campaign the Department is endeavouring to get every mother to avail herself of the help afforded by the centres. The first and foremost aim of Baby Health work is prevention—to keep the well baby well. The centres are not intended to usurp the function of the medical practitioner, and mothers are advised that a sick baby should be taken to a doctor at the earliest possible stage of illness.

Prenatal Care.—Under modern conditions of life, the normal function of childbirth has become one in which each year in this State alone some 300 mothers lose their lives. Prenatal care is the first line of defence in safeguarding the mother and avoiding the complications that may arise during pregnancy and childbirth.

One prenatal clinic is contemplated at Broken Hill as soon as the maternity ward at the District Hospital is completed, and, pending the establishment of other such clinics, provision has been made at the Baby Health Centres for expectant mothers to obtain certain advice and help. During the year some 3,000 expectant mothers utilised the centres in this connection.

Infantile Mortality Rate.—Reference is frequently made to the low rate of infantile mortality in New Zealand. When statistics extending over a period of forty years are compared they show that the infantile mortality rate in New Zealand has always been lower than in New South Wales and that a comparison of the general lowering of the rate year by year in the two countries reflects no discredit on New South Wales. It then remains to determine the reason of the higher rate here. The most potent factors probably are the difference in climate, and the conditions of housing, &c., inseparable from large cities and larger centres of population. New South Wales has to contend not only with the moist humidity of the coastal districts during the summer months, but with the far greater problem of the excessively hot and dry Western Division, with its plague of flies—" Man's greatest helpmate in spreading disease." The infant mortality in the Western Division is excessive, and Baby Health Centres alone cannot solve the problem. The cause of this excessive mortality is probably bacillary dysentery, and improvement in the general sanitation is an urgent and vital necessity, and on this attention is being focussed.

Undoubtedly much remains to be done ; the need for extension of the work is very great and until the public is seized with its importance progress will not be as rapid as is desirable.

Baby Health Centres are being opened in country districts wherever possible, and it is hoped within a few years to have the whole State adequately supplied, and to have a nursing staff equivalent to 1 per 10,000 of the population. It was intended to present in this Annual Report a comprehensive survey of the problem of infant mortality especially as it applies to this State. Owing to the absence of the Director-General of Public Health on special leave, the Director of Maternal and Baby Welfare has been unable to devote the necessary time to this investigation.

It is hoped that this investigation and special report will be included in the Annual Report for 1927.

Publicity Work.—Late in the year a publicity officer was appointed to arouse public interest in the work of the Baby Health Centres, and paragraphs and articles are now regularly issued to the daily metropolitan press and the suburban and country papers on maternal and baby welfare and cognate matters. Leaflets containing information for " The Expectant Mother," " Mothers ! Are you Breast-feeding your Baby ? " " Learn How to Wean," " Parents ! Are you Taking Care of your own and your Children's Teeth ? " and " Feeding of Children—from 9th month to the end of the Second Year," can be obtained at the Baby Health Centres or from the Office of the Director-General of Public Health.

Radio Talks and Lectures.—Weekly radio talks have been broadcasted from Station 2BL, and in addition two or three talks and lectures weekly have been given to interested audiences.

Schools.—By an arrangement with the Education Department a course of lectures by the Baby Health Centre nurses was given to pupils attending domestic science courses. Some thirty schools have been visited and great interest was taken, both by the teachers and pupils in the demonstrations.

Ideal Homes Exhibition.—A special grant of £150 was obtained for a display of Baby Welfare work at the Ideal Homes Exhibition. More than 32,000 people visited the Exhibition and great interest was taken by parents in the display and in the advice obtainable on all branches of mothercraft.

Display in Shop Windows.—The thanks of the Department are tendered to Messrs. Nock and Kirby, who during " Health Week " placed one of their large show windows at the Department's disposal for a display concerning our Baby Welfare activities and propaganda.

METROPOLITAN COMBINED SANITARY DISTRICT—REPORT BY THE MEDICAL OFFICER OF HEALTH, DR. J. S. PURDY (p. 78).

The birth-rate of 20.40 per 1,000 of population was the lowest recorded for the metropolis. The number of births (21,487) was 549 below the previous year, and the rate 10·7 below the average of the previous five years. Dr. Purdy remarks that as a general rule the birth-rate declines as the standard of comfort, convenience and earning power of the community increases.

Ten thousand and fifty-six deaths were recorded for the metropolis, equivalent to a rate of 9·3 per 1,000 of the population and 3·5 per cent. above the average of the preceding five years.

Diseases of the heart were again the chief cause of death, and the need is urged of propaganda to make the public realise that these diseases might be minimised to a large extent if persons who are over 40 years of age underwent regular medical examination and exercised moderation in their habits of living, particularly avoiding over-fatigue both in work and exercise after 45 or 50 years of age.

HUNTER RIVER COMBINED SANITARY DISTRICT—REPORT BY THE MEDICAL OFFICER OF HEALTH, DR. H. G. WALLACE (p. 96).

The estimated mean population in 1926 was 191,780, an increase of 4,990 compared with 1925. The residents are chiefly engaged in industrial, coal-mining and pastoral occupations.

Births numbered 5,209, giving a crude birth-rate of 27·16, compared with 22·88 for New South Wales. The infantile mortality rate was 62·2, the average rate for the previous five years being 63·3.

There were 1,789 deaths from all causes, yielding a rate of 9·32, compared with 9·36 for the whole State.

Schick tests were made at some of the schools in the district, but with poor response to subsequent immunisation. Dr. Wallace states that a great deal of publicity by films, lectures and newspaper articles is needed to overcome prejudice on the part of parents.

Dick Tests.—In connection with the unusually high incidence of scarlet fever, a supply of toxin for the Dick test was obtained from the Commonwealth Serum Laboratories. 227 persons were tested, of whom 87 (38·3 per cent.) showed a positive reaction.

Dengue Fever.—(Report, pp. 99, 154)—For the first time on record Newcastle suffered from an epidemic of dengue fever. The outbreak extended from November, 1925, to April, 1926, and the first cases were variously diagnosed as measles, scarlet fever, influenza, and, even typhoid fever. The mosquito vector, *Aedes aegypti* (Stegomyia fasciata), had been known for some years to occur in the district. With one exception, all the municipalities in Newcastle and suburbs adopted Local Government Ordinance 41 ; a " mosquito week " was held, and by means of window-displays, posters, cinematograph films, and newspaper articles publicity was given to the need to eradicate the mosquito *Aedes aegypti.*

BROKEN HILL.

The position of Medical Officer of Health at Broken Hill has been vacant since 31st December, 1925. Vital statistics supplied by the Broken Hill Council are included on p. 104.

INDUSTRIAL HYGIENE (p. 49).

The Division of Industrial Hygiene is under the charge of Dr. Charles Badham, who has associated with him an engineer and a physicist as assistants. Dr. Badham was appointed during the year medical referee for industrial diseases, and has carried out the investigation of practically all cases of industrial disease which have come before the Workers' Compensation Commission, New South Wales. He has also actively assisted in the promulgation of the scheme for compensation of sandstone workers afflicted by silicosis. In connection with this work he has published in the Workers' Compensation Commission Reports a resumé of the work done in industrial disease under the heading of " Selected Cases of Industrial Disease which have come before Medical Boards and Referees during the years 1926–27."

Activities in the Sandstone Industries.—At the request of a Conciliation Committee of the Industrial Commission the Division of Industrial Hygiene has kept under observation the many railway tunnels and other excavations in sandstone, and has on many occasions sampled the air and tested the ventilation of these places. The personnel of these tunnels, which are being driven for the purposes of the City Underground Railway, worked under an award by which the hours of labour were shortened from 44 to 40 per week, if the dust in the air was above the standard set down by the Division of Industrial Hygiene. At the request of the Chairman of the Conciliation Committee, the task of determining what the hours of work should be in these places was undertaken by this division.

Activities in the Lead Industry.—Numerous cases of lead poisoning occurring in accumulator factories were diagnosed, and efforts were made to bring about the gazettal of regulations suitable to deal with the hazard of industrial lead poisoning which has become very rife in this industry. Every case of lead poisoning presented for diagnosis was investigated according to the methods detailed in an earlier report.

Activities in the Sphere of Ventilation.—Investigation into the ventilation of theatres in Sydney was continued, and in this report is a monograph, *Studies in Industrial Hygiene, No. 10, The Index of Comfort in the Ventilation of Theatres in Sydney* (p. 49). Recommendations are made that regulations for ventilation of Sydney theatres should provide for—

1. An air movement according to the curve (Appendix Ia) showing the air movements required between temperatures of 60 deg. and 80 deg. Fah., at an absolute humidity of 5 grains per cubic foot, the air movement to be procured by electric fans, or other means, and the machinery providing such movement to be capable of producing higher air movements to take care of occasional higher if not of extreme humidities.

2. An air supply according to the outside dry-bulb temperature. When the outside temperature is below 65 deg. Fah., not less than 20 cubic feet per person per minute, and when the outside temperature is above 65 deg. Fah., not less than 30 cubic feet per person per minute. The air supply to be produced by natural or other methods of ventilation.

3. The permissible rise in temperature in the theatre over the outdoor dry-bulb temperature to depend on the outdoor temperature. When the outdoor temperature is below 65 deg. Fah., the increase in temperature in the theatre must not exceed 9 deg. Fah., but when the outdoor temperature is above 65 deg. Fah., the increase must not exceed 6 deg. Fah.

In this investigation the authors state that :—

> " Our equation for comfort in Sydney theatres when the absolute humidity is 5 grains per cubic foot is :—
>
> $T - (60) = 9{\cdot}5 \log_{10} 2 (a - 15)$.
>
> Where T = dry-bulb temperature in degrees Fahr.
>
> a = air movement in feet per minute.
>
> The importance of air movement in the production of comfort is emphasised. On no occasion did we feel comfortable when the air movement was too small to be measured by the Katathermometer, yet with low absolute humidities or at low dry-bulb temperatures low air movements were capable of producing comfort. In this respect our work differs from that of recent American authorities who have not recorded the practical value for the production of comfort in the clothed body of air movements less than 100 feet per minute."

It is hoped that this investigation by the Division of Industrial Hygiene, which is probably the most important that has been done in the ventilation of Australian theatres, will result in an improvement in the hygienic conditions of our theatres.

Activities in the Rubber Industry (p. 73).—Associated with Dr. Moore, a medical officer of the Division of Industrial Hygiene of the Commonwealth of Australia, this Division has also carried out an investigation into the cause of dermatitis in the Sydney Rubber Works. They consider that the high incidence of dermatitis in one rubber factory has been brought by the use of a butyraldehyde condensation product of dimethyl-paraphenylene-diamine as an accelerator, the use for an isolated period of hexamethylenetetramine as an accelerator, and the use of benzine for cleansing hands and arms.

Other Industrial Activities.—Various minor investigations have been made into many industrial activities such as pyroxylin painting, oil spraying, brass foundries, iron foundries, potteries, chemical factories, and the process engraving industry.

MICROBIOLOGICAL LABORATORY: ACTING PRINCIPAL MICROBIOLOGIST, DR. E. L. MORGAN.
REPORT (p. 140).

The number of specimens examined in the Microbiological Laboratory showed an increase of nearly 20 per cent. on the work in 1925, the figures for the two years being—1925, 25,344 examinations; 1926, 30,627 examinations. The greatest increases were shown in the serological and diagnostic tests for venereal diseases. Other notable increases were in the examinations of swabbings for diphtheria, sputa for tuberculosis, pathological tissues for malignancy, and testing water samples from the public supplies of various inland towns. A comparatively new departure was the bacteriological examination of air samples collected under the direction of the Medical Officer for Industrial Hygiene (see report on Ventilation of Theatres, p. 49).

Typhoid Fever.—An investigation concerning two outbreaks of typhoid fever at Goulburn Gaol is reported on by Dr. Morgan (p. 146), and some notes are given in this section on the reduction of the typhoid fever rate in Forbes municipality following preventive inoculation (p. 149).

Diphtheria.—In the fourth report on the Schick test (p. 152) a summary is given of the districts in which the test was applied during the years 1923–1926 inclusive, and the question is raised whether satisfactory progress can be made in diphtheria prevention without a well organised publicity campaign.

Dengue Fever Outbreak (p. 154).—An extensive epidemic of dengue fever swept over the northern part of the State during the summer of 1925–26. The disease covered a much wider area than in previous epidemics, and was associated with an hitherto unknown abundance of the mosquito vector, *Aedes aegypti.* The area covered included all that portion of the State to the north and east of a line joining Newcastle to Bourke, with the exception of country lying above the 3,000 feet contour where the cool climate limited the breeding of *Aedes aegypti.*

It is interesting to note that Kyogle, where some degree of mosquito control was practised (see p. 163), had a very much lower dengue fever index than neighbouring towns, in which no control was attempted.

The epidemic has had the effect of stimulating interest in mosquito control with desirable results in certain areas.

An account of the outbreak in the Newcastle district is given in the report of Dr. H. G. Wallace (p. 99).

Mosquito Surveys.—A review of the mosquito problem in the Sydney district by Dr. I. M. Mackerras, Assistant Microbiologist, is contained on page 165. It stresses the importance of adequate preliminary investigations and the necessity for limiting control work strictly to those species of mosquitoes which are proven pests.

Tick Paralysis in Man in Australia.—A general account of tick paralysis in man has been compiled by Dr. I. M. Mackerras, and appears on page 168.

SYDNEY MILK SUPPLY.

The Director-General attended the Producers and Consumers' Conference held at Bathurst in September, 1926, when considerable attention was given to the quality and high cost of the Metropolitan milk supply. The object of this section of the Conference was to evolve a scheme whereby the quality of the milk would be improved, and the cost to the consumer considerably lowered. The following resolution was adopted by the Conference:—

> No. 14. *Milk.*—The distribution of milk in the Metropolitan area can be best administered by a Greater Sydney Council under a system of standard containers and block runs.
>
> For the Newcastle district the same methods are recommended under the control of a Greater Newcastle Council or a board appointed by Newcastle and adjacent local governing bodies.

Investigations into the Bacterial Content of the Sydney Milk Supply.—A report is included in the Microbiological section (p. 153) giving the result of the examination of 406 samples of suburban and country milks. Samples were taken from the cows' teat, vat or can before cooling, after cooling, and from the delivery cart tank, tap or bottle, in the case of suburban milk. In the case of country milks samples were taken before and after pasteurisation, at the storage vat and the cart.

Between 200 and 300 samples of milk were examined by Dr. Wallace at Newcastle, who reports that on the whole the milk was found to comply with the bacterial standard fixed by the Pure Food Regulations (p. 100).

Where a high count was found repeatedly in the case of a dairyman, an inspection of the dairy premises was made, and it was usually found that there was some obvious and preventable factor causing contamination. The most frequently found cause of a high bacteria count was dirty unwashed bails and milking sheds. When bails and sheds were properly washed down a reduction in the bacteria count followed. Another frequent cause was the storing of hay in the same shed where cows were being milked, or in a loft above the bails. Where such stores of hay were walled off from the milking shed a fall in the number of bacteria was found.

Tubercle bacilli in Milk.—A series of examinations for tubercle bacilli in milk were undertaken in 1923 with negative results (see p. 142 of the report for that year). A further series of investigations were begun in 1926, but had to be discontinued owing to pressure of other work. Arrangements have been made for the tests to be proceeded with during 1927.

SCHEME FOR EFFECTIVE CONTROL OF TUBERCULOSIS.

During 1926 progress was made with the scheme for combating tuberculosis. A conference was held in June, at which representatives were present from the various organisations interested in the question, and an agreement reached by which the campaign is to be vested in a Board of Control composed of—

(*a*) the Director-General of Public Health, Chairman (*ex officio*),
(*b*) one representative from each of the following institutions and organisations:—
  Australian Red Cross Society,
  Queen Victoria Homes for Consumptives,
  National Association for Prevention and Cure of Tuberculosis,
  Royal Prince Alfred Hospital,
  Sydney Hospital,
  Royal North Shore Hospital,
  Royal Alexandra Hospital for Children,
  The Consumptive Village Settlement Scheme,
  British Medical Association, and
  Two nominees of the Minister of Public Health.

This Board is to be the controlling authority over individual institutions in all matters of policy (subject to appeal to the Minister), and through a tuberculosis division to be established by this Department, to have full control over all institutions concerned in the matter of admission and discharge of patients.

The tuberculosis division will be charged with arranging through the appropriate channels for adequate maintenance, &c., of dependants; "after-care" and "follow-up" of patients discharged from institutions; the carrying out of educational propaganda for combating the disease; and the collection and collation of statistics. When the year closed steps were in progress for appointment of a Director of Tuberculosis.

Waterfall Sanatorium.—There were 548 admissions to Waterfall Sanatorium in 1926. Of a total of 985 patients under treatment for the year, 366 were discharged, and 432 were in hospital on 31st December. There were 187 deaths.

Of the 366 discharged patients, 53 were "arrested" cases having no signs of active disease; 69 were "much improved" and fit to return to ordinary light work; 212 were "somewhat improved," and 32 had not benefited.

Curative Treatment for Tuberculosis.—In recent years there has been constant research to find an effective curative treatment. One of the more recent is Sanocrysin (Mollegard's gold salt cure). A supply of Sanocrysin was obtained recently through the courtesy of Messrs. Parke, Davis & Co., and a number of patients at Waterfall Sanatorium are undergoing treatment with a view to forming an opinion as to its curative value. Other methods of treatment tested during the year consisted of Ostellin, Colloid Calcium and the Calcium salts, but none of these were found specially valuable. Otherwise treatment was mainly along ordinary sanatorium lines, though tuberculins and antigens were used in a few suitable cases; "Newell's Treatment" was tested with negative results.

Committee of Inquiry.—A Parliamentary Committee of Inquiry investigated the conditions under which work was carried on at Waterfall, and unanimously recommended that all the additions and improvements which had been pressed for during the last few years should be provided without delay.

Garden Plots.—An innovation was the provision of garden plots for suitable patients, the institution undertaking to buy all vegetables produced; owing to the bad season the returns from the plots were not satisfactory.

PREVENTION.

The subject of treatment is apt to loom so largely in the mind of the public that little thought is given to the far more important aspect of prevention.

To the health officer the prevention of infection is the vital point of attack. The two most important factors that have operated in reducing incidence and therefore the mortality from tuberculosis have been: (1) suitable and adequate nutrition, and (2) abundance of fresh air, particularly in the home and the work place—healthier living in all its aspects.

There is one fundamental necessity which must be provided in any scheme for control of this disease, viz., the hospitalisation of sufferers, particularly when in an infective condition.

It is not sufficient to supply hospital or sanatorium accommodation; we must persuade the sufferer to avail himself of the facilities afforded, and this implies the provision of further and adequate accommodation.

Although tuberculosis is an infectious disease it differs, generally speaking, from other infectious diseases in one particular—chronicity.

Recovery, in the vast majority of cases, is slow, so that the patient is faced with a long and tedious convalescence. It is this factor which in great measure singles out tuberculosis as a poverty-producing disease, resulting in a vicious spiral into the vortex of which other members of the family are drawn. Where the patient happens to be the breadwinner he tends to hold on to the last in a vain attempt to stem the approaching tide of poverty or want.

He will not enter a sanatorium in the early stage of the disease when the prospect of cure is greatest, chiefly because he does not wish to leave the family to fend for itself.

Rightly or wrongly the fear of want holds him to the family in the erroneous idea that he is a protection. As a fact he is a potential if not an actual danger. His illness and his inability to follow his employment regularly bring about the want he fears so much, but what is worse he destroys his main choice of recovery. In a word he may be said "to sell his birthright for a mess of pottage." Granting that he remains with his family the inevitable consequences follow. The poverty reduces the resistance of other members of the family, his disease progresses, and he unconsciously subjects the household to massive infection. Thus is the disease spread in far too many instances, and instead of there being one individual sufferer we now have several.

Compulsory segregation being out of the question—since this would not only be resented, but would cause hardship to the family and discontent to the patient—some other alternative must be found.

If we can eliminate the fear of want; if we can make provision for the dependants of a sufferer, there is offered to him every inducement to obtain treatment for his condition at the earliest possible moment. In this way the patient is restored to health, if this be possible; but at least his family is protected from a lowered resistance, the result of poverty, and from exposure to massive infection.

By such means the public health would be safeguarded in a rational, effective manner; we would make a definite attack on the disease at its source, and we would tend to prevent the perpetuation of the disease in the community.

Is this a practicable measure ? Every consideration shows it to be so. It may mean a present large but progressively dwindling annual sum, but this expenditure would achieve results. A greater expenditure will be made over any given number of years under the present system, whereby we make a futile attempt to repair casualties without making any real attempt to prevent their origin.

If every sufferer who has dependants were assured that those dependants would be provided for on the basis of, say, the basic wage, he would be prepared to undergo treatment with a free mind.

This would be a real preventive effort which, in my opinion, would produce outstanding results. Sooner or later this scheme will be put into operation, for it is obviously the next step in the control of a gigantic problem.

After-care and Training.—Another problem to be faced is how to devise a scheme to absorb in suitable occupations all those persons discharged from sanatoria whose living conditions are not such as to give them a reasonable chance of restoration to health. In the majority of cases it is necessary for such persons to be placed under the best possible conditions, and these are often extremely difficult to find.

Where an individual has been trained in a particular trade or industry he tends naturally towards his usual vocation. Very frequently this must prove detrimental to his welfare, and he is thus faced with an acute position—either to renounce the work at which he can earn, at least for a time, a living, or to follow some less congenial and less remunerative occupation. Few will be prepared to learn a new trade or occupation which might enable them to carry on in a more suitable environment. The result is that the majority gravitate to their original environment which, in greater or lesser degree, brought about the invalidity.

A study of the vocational schemes in operation in other countries discloses that only a fraction of the affected persons are absorbed by them. At best the patients who are accommodated in special village settlements or similar vocational schemes must be specially selected. The conditions of life associated therewith will not appeal to a large number of suitable individuals, so that the potentialities of such schemes are difficult actually to realise. There is little doubt that vocational schemes possess a distinct, but limited value, and it is inadvisable to conclude that any one method of attack on such a problem as tuberculosis necessarily means success.

All avenues of control should be exploited fully, for it is only by a comprehensive campaign that a solution of this outstanding problem will be found.

Shortage of Hospital Accommodation.

There is acute need for more hospital beds in the metropolitan district. Sixty additional beds were provided by taking over a portion of the Prince of Wales Hospital at Randwick from the Military authorities. These beds will be used as an auxiliary of the Coast Hospital, and will be staffed and supervised by that institution. The Prince of Wales Hospital passed into the occupation of the Defence Department on 25th August, 1915, under a military order; since 1920 negotiations between the Commonwealth and State Governments have been in progress for return of part of the building to this Department for use as a hospital. A tentative agreement has been reached by which the property will be handed back to the State for hospital use subject to a permissive occupancy by the Commonwealth Government for a period of three years, with renewal as occasion requires, of the buildings needed by patients under the control of the Repatriation Commission. The total number of beds that can be made available at this hospital must receive early attention. Judging by the acute shortage of hospital accommodation during the past two years upwards of 300 additional beds are needed to meet reasonably the requirements of the next few years.

In common with other large cities Sydney is faced with a daily increasing number of serious motor accidents, and the long stay in hospital required by many of these patients, is doubtless a factor in increasing the shortage of surgical beds.

Above all, hospital accommodation in the metropolitan area has not kept pace with the growth of population in the metropolitan area itself, and in the State as a whole.

It must be remembered that the metropolitan hospitals supply accommodation for country cases which require special investigation and treatment in addition to the usual demand in the metropolis itself.

The lack of accommodation has necessitated an increasing number of patients receiving treatment in our State hospitals and homes which are slowly but surely being transformed into general hospitals. During the transition period these institutions are working under tremendous difficulties owing to lack of facilities and the countless requirements of a modern general hospital.

Coast Hospital: Report by the Medical Superintendent, Dr. R. J. Millard (p. 106).

Ten thousands one hundred and seventy-five patients were admitted to the Coast Hospital in 1926, an increase of over 1,700 on the figures for 1925. The daily average of occupied beds was 668·9 as compared with 578·06 in 1925.

Work in the infectious wards was heavy, a total of 3,591 cases being admitted. Diphtheria, scarlet fever, and measles were present in epidemic form in the metropolitan area practically throughout the year. There were 1,557 admissions of scarlet fever cases to the Coast Hospital, compared with 893 in 1925, and the fatality rate was high—2·4 in 1926, compared with 1·3 in 1925.

Abortion.—Six hundred and twenty patients were treated at the Coast Hospital for abortion in 1926. Dr. Millard again directs attention to the startling rate of increase in the admissions for this condition.

FREE ISSUE OF INSULIN.

About two years ago a diabetic ward was opened at the Coast Hospital and some ninety patients are now treated yearly with insulin. During their stay at the hospital, the patients are encouraged to take an intelligent interest in the effect of diet and treatment on their condition, and their stay in hospital can thus be made of great educational value to them. After discharge, patients periodically attend the hospital for examination and advice, and supplies of insulin are continued where necessary. At the Coast Hospital about £200 a year is spent on insulin, which may be regarded as a good health investment. Patients after their discharge are usually able to live a fairly normal life, and continue their usual occupation so long as they continue insulin treatment.

Supply of Insulin to Patients Treated Elsewhere.—Tentative arrangements have been made for supply of insulin to diabetic outdoor patients at other hospitals, in cases where such patients are not in a financial position to provide it for themselves. The amount of insulin required may cost from 7s. 6d. to 10s. a week, and if it is not obtainable the patient would probably have to return to hospital for further in-patient treatment. Such issues will be closely supervised to provide against any abuse of the concession.

CANCER RESEARCH.

The series of graphs following page 42 includes one which shows the gradual diminution in the number of deaths from tuberculosis from 1875 onwards, and the steady rise in deaths from cancer. In 1926 there were 2,157 deaths from cancer, equal to a rate of ·93 per 1,000 living. This rate was 4 per cent. above the average for the previous five years.

In connection with the State-wide cancer campaign, the Government granted a subsidy up to £5,000 on a £1 for £1 basis to the Cancer Research Committee of the University of Sydney, and also agreed to contribute £250 to the Cancer Research Committee to cover half the cost of a report by Dr. Burrows on problems connected with radio-therapy treatment of cancer. There was also co-operation with the Committee in the matter of propaganda and publicity; and posters and leaflets on cancer were issued by this office.

ROOKWOOD STATE HOSPITAL AND ASYLUM: REPORT BY MEDICAL SUPERINTENDENT, DR. R. A. FOX (p. 132).

The Medical Superintendent reports that further accommodation is urgent. In 1926 there was a daily average population of 1,457 inmates at Rookwood. The maximum number of persons housed at one time was 1,566, of whom 881 were hospital patients, and 685 old and infirm persons cared for in the inmate division. The standard number of beds in all hospital wards is 745, but at times the number of patients to be provided for has exceeded 900.

LIVERPOOL STATE HOSPITAL AND ASYLUM: REPORT BY MEDICAL SUPERINTENDENT, DR. D. WALLACE (p. 134).

Two new pavilions were opened early in the year, and increased the accommodation to 723 beds (hospital division, 299; inmate division, 424). As many as 742 persons were in residence at one time in some of the winter months, making an undue tax on the resources of the institution, particularly the hospital division.

Dr. Wallace again draws attention to the need for provision of hot and cold water services in the wards. To an outsider it sounds incredible that in a hospital of 300 beds it should be necessary to carry water into the wards.

NEWINGTON STATE HOSPITAL AND ASYLUM.

Many of the aged pioneer women of the State who are without homes are cared for at Newington, where there was an average daily population of 692 persons in 1926.

The surroundings of this picturesque home were further improved by reclamation of about 15 acres of land affected by the tidal waters of the Parramatta River. This work removed a number of stagnant waterholes, which were a prolific breeding-ground for mosquitos.

ENTERTAINMENT OF PATIENTS.

Much kindly help has been given by Australian Films, Ltd., the "Smith Family," and other gifted persons, who have provided picture shows, entertainments, and concerts at the institutions throughout the year.

This opportunity is taken to thank the many kindly-hearted citizens who throughout the year have provided entertainments for the inmates of the various State hospitals and institutions under charge of the Director-General of Public Health. Rookwood State Hospital has its own cinema machine, and gives a picture entertainment once a week. During the year the Women's Auxiliary of the Auburn Sub-branch of the Returned Soldiers and Sailors' Imperial Service League donated a five-valve wireless set with loud speaker to the Chest Ward, and this has proved a great pleasure. The Red Cross Society donated a billiard-table, and the hospital staff has erected a billiard and recreation room from funds available under the Hennessy bequest.

At the Liverpool State Hospital concerts have been provided for the inmates at frequent intervals by visitors, and wireless sets have been installed by Sun Newspapers, Ltd., for the benefit of inmates and patients in two of the general wards and the cancer division.

Amusements and diversions at the Waterfall Sanatorium included a wireless installation provided by public subscription, and a number of cinema entertainments and concerts given by visiting artists. Mrs. John Fuller presented the women patients with a billiard table, and the Hon. R. B. Orchard and other kind friends provided sufficient bowls to meet all requirements,

WHOLE TIME MEDICAL OFFICERS OF HEALTH FOR COUNTRY DISTRICTS.

Scheme for Administration throughout New South Wales.—The scheme for subdivision of the State into districts for health administration purposes is still in abeyance. The establishment of six such divisions, each in charge of a resident medical officer, with a competent staff, is necessary. Although the actual administration would be centralised in Sydney the appointment of specially trained medical officers in convenient centres would be the means of bringing about better sanitary conditions and thereby improved health amongst the populations in which they served. The establishment of a public health laboratory under the control of the medical officer of health in each of the districts would make available facilities which are of the greatest importance in connection with the prevention of disease.

Western Division.—In regard to the very scattered and sparsely populated Western Division it is considered that the best results would be obtained by having an experienced sanitary inspector stationed at Broken Hill. From that centre he could periodically visit all other parts of the district and advise on matters of sanitation.

INCREASE IN EXPENDITURE DUE TO EXTENSION OF HEALTH ACTIVITIES.

The amount of £359,276 voted on the 1925–26 estimates was found quite inadequate to meet the requirements of the Office of the Director-General of Public Health for 1926–27 when an amount of £424,972 was provided to cope with the expansion of the Department in regard to Baby Health Centres, Industrial Hygiene, control of Venereal Diseases, provision of additional hospital accommodation and other urgent public health requirements.

INADEQUACY OF THE HEALTH DEPARTMENT BUILDING.

Representations have been made for many years that the existing building occupied by the staff of the Director-General of Public Health is quite inadequate for the needs of public health work. During 1926 the building has been visited by members of the Public Works Standing Committee, who were shown the congested conditions under which work must necessarily be carried on until more space is provided. Approval has been given for erection of a building at an approximate cost of £60,000, and plans and specifications are in course of preparation for its erection.

To meet the most urgent needs arising from transfer of the staff of the Baby Health Centres to this office, organisation of the Nurses' Registration staff, &c., office accommodation was secured by leasing the fourth floor of Wiltshire Building, adjacent to this office. The Dairy and Sanitary Inspection staffs, previously housed in Richmond-terrace, have been transferred to that building, together with the Pure Food officers, who formerly occupied the annexe to this building, now being utilised to house the staffs of the Nurse Inspectors attached to the Baby Health Centres and the staff of the Nurses' Registration Board. It will be necessary to locate the Tuberculosis Branch at Richmond-terrace pending extension of this building. The Metropolitan Medical Officer of Health and his Staff have occupied rooms for many years n the Q. V. Building owing to shortage of accommodation in this Department.

PROPAGANDA FOR BETTER HEALTH.

In the belief that health is a purchasable commodity and that publicity work on the ways and means available to citizens for conserving and improving their own and their children's health is an important and essential part of this Department's activities, measures were taken to appoint a publicity officer. The duties of this officer are to promulgate an effective publicity campaign by the regular issue of articles and paragraphs to the daily suburban and country papers, particularly on the subject of maternal and baby welfare.

Other measures of propaganda throughout the year have been lectures and addresses by medical officers of the Department on the milk supply, pure food, sex hygiene and prevention of venereal diseases, disinfection, diphtheria prevention, mosquito and fly control, &c., illustrated wherever possible by films and lantern slides.

Films.—Ministerial approval was given during the year for the purchase of several films dealing with important aspects of preventive medicine, and these have been found most helpful and instructive for lectures on public health subjects. Arrangements are in progress for preparation of popular local films emphasing various aspects of health maintenance and improvement.

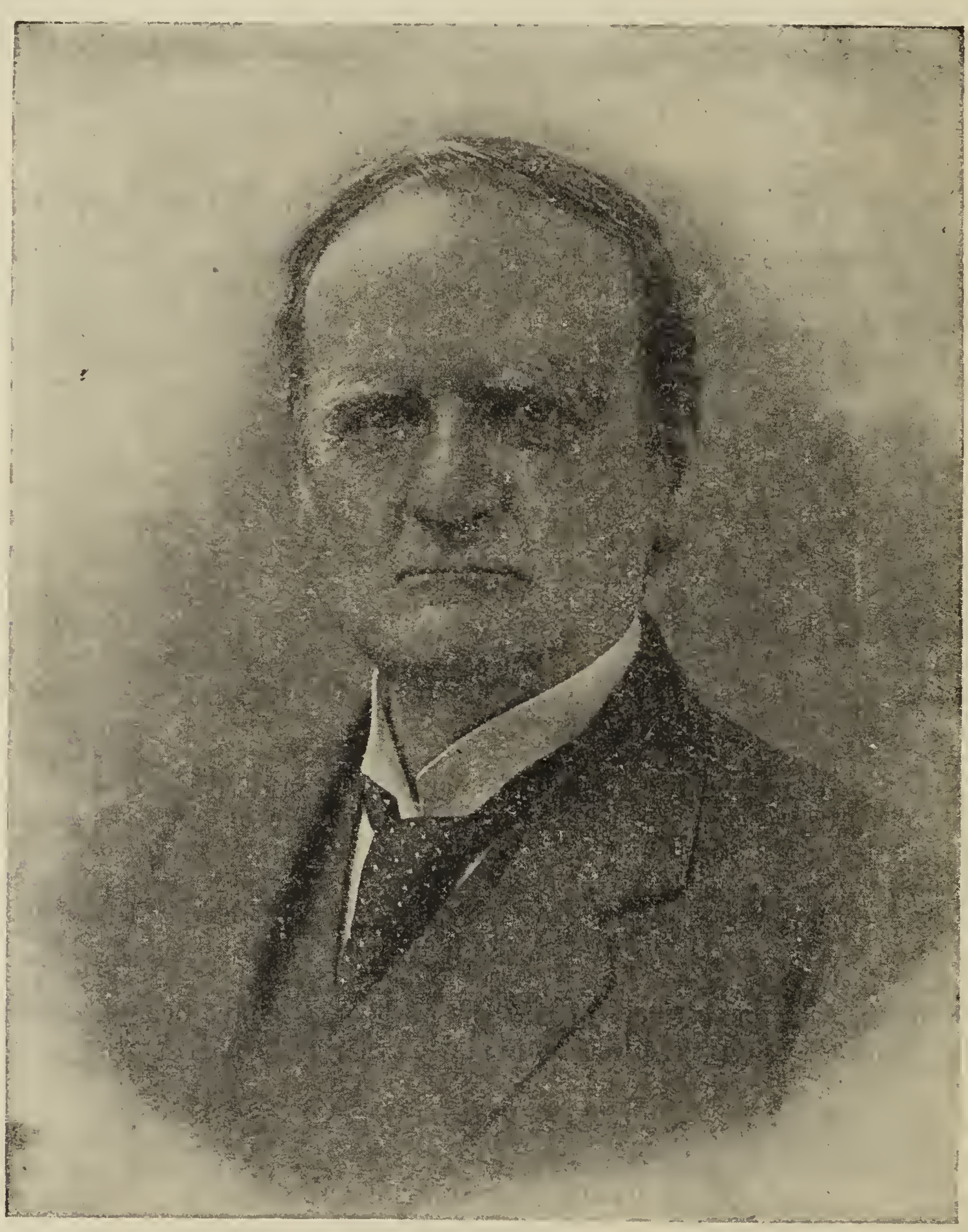
Health Weeks.—Assistance has been given by officers of the Department in the organisation of Health Weeks, particularly in country districts. This form of propaganda is of great importance, serving as it does to concentrate the attention of every member of the community on the importance of health and of his or her part in the general responsibility for its maintenance. In the metropolitan district the first week in October is annually celebrated as " Health Week " and yearly attracts greater attention. Appropriate posters are exhibited throughout the city, and business firms in central positions place windows at the committee's disposal for exhibits emphasising one or other aspects of Health work. The thanks of the Department are tendered to Farmer & Co., Nock and Kirby, and other firms for show windows and other assistance afforded.

Posters and leaflets have been widely displayed and distributed on baby welfare work, and on prevention of cancer, consumption, infantile paralysis, dengue and the more common infectious diseases.

DEATH OF SIR CHARLES MACKELLAR.

Sir Charles Kinnaird Mackellar, the first president of the Board of Health and one of the original members, died in July, 1926, at the age of 82 years. Sir Charles (then Dr.) Mackellar, was chosen as the first President of the Board of Health when it was constituted in 1882 under the Infectious Diseases Act. He resigned the position three years later to engage in active political work, but he was continuously a member of the Board until his resignation in June, 1925.

In dealing with his resignation the Board passed a resolution recording the inestimable value of his services in the interests of public health, and of his unique record, extending over a period of almost forty-five years, during which he had devoted himself wholeheartedly in furtherance of the objects for which the Board was established, and in the foundation of which he took such a prominent part.



The late Sir Charles was born in Sydney on 5th December, 1844, and was the eldest son of the late Dr. Frederick Mackellar, who was chief medical officer of Sydney Hospital. He was educated at the Sydney Grammar School and at the Glasgow University, where he gained the M.B. and Ch.M. degrees.

Sir Charles had a distinguished medical and political career, and was one of the best known citizens of the State. The work nearest his heart was on behalf of infants and young children, and he worked unceasingly for the passing of the Infants Protection Act and other similar measures to safeguard their interests.

RETIREMENT OF MESSRS. A. LAKE, E. THORNTHWAITE, H. J. TOMPKINS, AND MATRON ALICE WATSON (COAST HOSPITAL).

The Department lost by retirement four valued officers who had served well and faithfully for many years. The genial accountant, Mr. E. Thornthwaite, who was transferred to this Department in 1900 to reorganise the Accounts Branch retired in September, 1926, on attaining the age of 60 years.

Mr. A. Lake, who for many years was attached to the Hospitals and Charities Branch of the Department, and later was manager of the Rookwood State Hospital and Asylum, retired in March, 1926, on attaining the age of 65 years.

Mr. H. J. Tompkins joined the Record Branch of the Department in 1897, and later was given the post of Inspector of Hospitals and Asylums. He held that position until his retirement in July, 1926, at the age of 65 years. Mr. Tompkins' little booklet " With Swag and Billy " is well known to every lover of walking.

The popular matron of the Coast Hospital, Miss Alice Watson, who had filled the responsible and important position of matron of the Coast Hospital for twenty-one years, retired in May, 1926.

APPRECIATION.

Thanks are once more tendered to the Crown Solicitor, the Commissioner of Police, the Government Statistician, the Public Works Department, and other branches of the Public Service for assistance rendered throughout the year in various directions affecting the public health.

I desire to express my appreciation to all the officers of the Department for their loyal co-operation in carrying out the multifarious activities associated with public health progress.

T. H. NEELY,
Secretary.

E. SYDNEY MORRIS,
Acting Director-General of Public Health.

Vital Statistics.

Extract from the Report of the Government Statistician, Mr. T. Waites, on the Vital Statistics of New South Wales for 1926 :—

Population.—The population at the end of 1926 was 2,349,401, of whom 1,197,428 were males and 1,151,973 females, the proportion being 104 males to 100 females. During the year the population increased by 49,320, or 2·14 per cent., of which 30,938 was due to the excess of births over deaths, and 18,382 to the excess of arrivals over departures. The mean population was 2,321,917.

Marriages.—The number of marriages was 19,219, corresponding to a rate of 8·28 per 1,000 of the population. The rate is 0·6 per cent. above the average of the previous five years. In the Metropolis the rate was 9·86, and in the remainder of the State 6·97, per 1,000 of population.

The proportion of males married who were under 21 years of age was 7·18 per cent., and of females 25·94 per cent. The proportion in both cases is above the average for the previous five years.

Of the marriages, 18,031 were celebrated by the clergy and 1,188 by registrars. The largest number 8,228, were celebrated according to the forms of the Church of England; then followed the Roman Catholic Church with 3,992, the Presbyterian with 2,540, the Methodist with 2,143, and all others 1,128.

Births.—The total number of births was 53,126, equivalent to 22·88 per 1,000 of population, which is 7·9 per cent. below the average of the previous five years. Of this number 27,221 were males and 25,905 females, the proportion being 105 males to 100 females.

Dividing the State into the Metropolis and remainder of the State, there were 21,487 births in the former and 31,639 in the latter, corresponding to rates of 20·40 and 24·94 respectively. In the Metropolis the rate is 10·7 per cent., and in the remainder of the State 5·6 per cent., below the average of the previous five years.

The number of illegitimate births was 2,748, equal to 5·2 per cent. of births, which is 6·1 per cent. above the quinquennial average. In the Metropolis the proportion was 7·1, and in the remainder of the State 3·9, per cent. of births. The relatively high proportion in the Metropolis is influenced greatly by the presence of seven public maternity institutions, and numerous private lying-in homes. Proportionately to population, illegitimate births represented 1·18 per 1,000, which is 3·3 per cent. below the average of the last five years.

Deaths.—The deaths during the year numbered 22,188, equivalent to a rate of 9·56 per 1,000 of the population. This rate is 2·8 per cent. above the average of the previous five years.

The total includes 12,685 males and 9,503 females, equivalent to rates of 10·72 and 8·34 respectively per 1,000. The rate in the Metropolis was 9·70 per 1,000, and in the remainder of the State 9·43.

Of the 22,188 people who died during the year, 4,119 were under 5 years of age, 9,763 were aged from 5 to 64, and 8,290 were 65 and over. The ages of the remaining sixteen adults were not specified. The rates per 1,000 living in the main groups, under and over 5 years, were 15·84 and 8·76 respectively, as compared with 16·98 and 8·31, the average of the previous five years.

Infantile Mortality.—The number of children under 1 year of age who died was 3,060, equal to 57·6 per 1,000 births. To this total the Metropolis contributed 1,315, or 61·2 per 1,000 births, and the remainder of the State 1,745, or 55·2 per 1,000 births. The rate for 1926 is 1·4 per cent. below the average of the previous five years. Of the deaths under 1 year of age, 1,288, or 42 per cent., occurred under 1 week, 1,635, or 53 per cent., under 1 month, and 1,985, or 65 per cent., under 3 months.

Causes of Death.—Of the deaths during the year, the most important causes were as shown in the following statement, which, for purposes of comparison, also gives the average number of deaths during the preceding five years, due allowance having been made for increase in population :—

Causes of Death.	Number, 1926.	Average Number, 1921–25.	Increase (+) or Decrease (–) in 1926.
			per cent.
Typhoid Fever	80	108	– 26
Measles	90	55	+ 64
Scarlet Fever	53	18	+ 194
Whooping-cough	132	178	– 26
Diphtheria	147	220	– 33
Influenza	317	325	– 2
Plague	...	2	...
Erysipelas	35	33	+ 6
Infantile Paralysis	14	10	+ 40
Lethargic Encephalitis ...	33	28	+ 18
Epidemic Cerebro-spinal Meningitis	23	29	– 21
Other Epidemic Diseases ...	87	49	+ 78
Tuberculosis, Respiratory System	1,144	1,168	– 2
Tuberculous Meningitis ...	63	55	+ 15
Other Tuberculous Diseases ...	79	79	...
Cancer	2,157	2,072	+ 4
Diabetes	263	279	– 6
Leucæmia, Anæmia, Chlorosis...	235	218	+ 8
Other General Diseases... ...	523	479	+ 9
Meningitis	179	159	+ 13
Cerebral Hæmorrhage	1,027	743	+ 38
Insanity	92	148	– 38
Convulsions of Infants	67	74	– 9
Other Diseases of the Nervous System	717	600	+ 20
Diseases of the Heart	3,280	2,865	+ 14
Diseases of the Arteries, Atheroma, etc.	379	573	– 34
Other Diseases of the Circulatory System	80	111	– 28
			per cent.
Bronchitis	410	462	– 11
Pneumonia	1,608	1,583	+ 2
Other Diseases of the Respiratory System	258	284	– 9
Diseases of the Stomach ...	178	147	+ 21
Diarrhœa and Enteritis (under 2 years)	801	875	– 8
Diarrhœa and Enteritis (2 years and over)	259	240	+ 8
Appendicitis	187	183	+ 2
Hernia, Intestinal Obstruction	209	221	– 5
Cirrhosis of the Liver... ...	122	109	+ 12
Other Diseases of the Digestive System	351	309	+ 14
Bright's Disease (Acute and Chronic)	1,108	1,093	+ 1
Other Genito-Urinary Diseases	359	373	– 4
Puerperal Septicæmia... ...	67	87	– 23
Other Puerperal Diseases ...	209	222	– 6
Malformations	229	249	– 8
Congenital Debility	247	318	– 22
Prematurity	897	921	– 3
Other Developmental Diseases	295	302	– 2
Senility	1,073	1,126	– 5
Suicide	293	248	+ 18
Accident...	*1,256	1,071	+ 17
All other Causes	477	493	– 3
Total	22,188	21,594	+ 3

* Includes 256 from motor accidents.

Epidemic Diseases.—The deaths from epidemic diseases numbered 1,011 as compared with an average of 1,055 during the previous five years, a decline of 4 per cent. The deaths from scarlet fever numbered 194, an experience which was 53 per cent, greater than the average of the previous five years.

Tuberculosis of the Respiratory System was the cause of 1,144 deaths in 1926, the rate, ·49 per 1,000 living, being 2 per cent. below the average of the five years 1921–25. Speaking generally, the death-rate from tuberculosis has been declining for some years past. The deaths of males numbered 691, and of females 453, and the rates per 1,000 living were ·58 and ·40 respectively. The mortality from other tuberculous diseases was 6 per cent. above the average.

Cancer.—The deaths from cancer numbered 2,157, equal to a rate of ·93 per 1,000 living, and 4 per cent. above the average of the preceding quinquennial period. The deaths of males numbered 1,175 and of females 982, the rates for each sex being ·99 and ·86 per 1,000 respectively. The death-rate from this disease has been increasing steadily for a number of years.

Cerebral Hæmorrhage.—To cerebral hæmorrhage and apoplexy during 1926 were ascribed 1,027 deaths, of which 539 were those of males and 488 of females. The rate was ·44 per 1,000 living, or ·46 for males and ·43 for females. The higher rate for this disease, viz., 38 per cent. above the average, may be attributed to the fact that during 1925 a revised manual of joint causes of death, based on the 1920 International List was adopted. In this manual cerebral hæmorrhage as a cause of death receives greater weight than was formerly the case—notably when stated in combination with diseases of the arteries, atheroma, &c.

Diseases of the Heart were the cause of 3,280 deaths, the rate being 1·41 per 1,000. The apparent increase in these deaths during the last twenty-five years is probably the result of the greater attention given to pathological diagnoses. The rate in 1926 was 14 per cent. above the average of the preceding five years. Of the total deaths, 1,805 were of males and 1,475 of females, the corresponding rates per 1,000 living of each sex being 1·53 and 1·30.

Bronchitis and Pneumonia.—Bronchitis with 410 deaths, equal to a rate of ·18 per 1,000 living, showed a decrease of 11 per cent., and pneumonia with 1,608 deaths, or ·69 per 1,000, an increase of 2 per cent. as compared with the experience of the previous five years.

Of the details from bronchitis, 231 were of males and 179 of females, or ·20 and ·16 per 1,000 living respectively. Of the persons who died from pneumonia, 928 were males and 680 were females, and the rates were ·78 and ·60 per 1,000 living of each sex.

Bright's Disease.—During 1926 there were 1,467 deaths due to diseases of the genito-urinary system, of which 1,108 were caused by acute nephritis and Bright's disease. The rate for nephritis (acute and chronic) was ·48 per 1,000 living; for males, ·53 per 1,000, and for females ·42 per 1,000. In 1926 the rate was 1 per cent. more than the average of the previous five years. The general tendency of the rate has been to increase.

Senility.—The deaths from this cause numbered 1,073, equivalent to a rate of ·46 per 1,000 living or 5 per cent. less than than the average during the years 1921–25. Many deaths formerly attributed to senility are now ascribed to some form of heart disease, with the result that deaths from senility, so described, have shown a considerable decrease.

Of the total deaths from senility, 624 were males and 449 females; the corresponding rates per 1,000 living were ·53 and ·39.

Diseases of Infants.—The principal causes were prematurity 896, other developmental diseases 755, diarrhœa and enteritis 625, pneumonia 241, whooping-cough 80, convulsions 56, and bronchitis 46.

The following statement shows the causes of deaths of children under 1 year of age, per 1,000 births, during 1926, in comparison with the preceding five years:—

Causes of Death.	Males.		Females.		Total.	
	1926.	1921–25.	1926.	1921–25.	1926.	1921–25.
Epidemic Diseases...	3·5	3·2	2·8	3·4	3·2	3·3
Tuberculous Diseases	·3	·3	·4	·3	·3	·3
Syphilis	·2	·3	·3	·3	·3	·3
Meningitis	·8	·7	·5	·6	·6	·6
Convulsions	1·3	1·0	·9	1·0	1·0	1·0
Bronchitis	·9	1·3	·9	1·2	·9	1·2
Pneumonia	5·0	6·1	4·0	5·0	4·5	5·6
Diarrhœa and Enteritis	13·0	13·3	10·5	10·3	11·8	11·8
Premature Birth	18·9	17·4	14·7	14·4	16·9	16·0
Other Developmental Diseases	16·2	17·2	12·1	12·3	14·2	14·8
Other Causes	4·2	3·8	3·5	3·2	3·9	3·5
All Causes	64·3	64·6	50·6	52·0	57·6	58·4

SECTION I.

A.—Public Health Administration.

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C.—Industrial Hygiene*.

(Medical Officer of Industrial Hygiene, Charles Badham, M.B., Ch.M., B.Sc.; Assistants, C. F. Assheton, B.E., and H. E. Rayner, B. Sc.)

Studies in Industrial Hygiene:—

Serial No. 10—On the Index of Comfort in the Ventilation of Theatres in Sydney, New South Wales, by C. Badham, M.B., Ch.M., B.Sc.; C. F. Assheton, B.E., and H. E. Rayner, B.Sc. 49

Serial No. 11—The Cause of Occupational Dermatitis in Sydney Rubber Works in 1927, by C. Badham, M.B., Ch.M., B.Sc., and K. R. Moore, M.B., Ch.B. 37

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A.—PUBLIC HEALTH ADMINISTRATION.

CHEMICAL LABORATORY.

REPORT OF GOVERNMENT ANALYST FOR THE YEAR ENDED 31ST DECEMBER, 1926.

Staff.

Government Analyst: Thomas Cooksey, Ph.D., B.Sc., F.I.C., F.A.C.I.

Second Government Analyst: William M. Doherty, F.I.C., A.A.C.I.

Senior Assistant Government Analyst: Sidney G. Walton, A.A.C.I.

Assistant Government Analyst: Harold B. Taylor, M.C., D.Sc., A.A.C.I.

Analysts:
Arthur D. Dibley, A.S.T.C., A.A.C.I.
Robert G. O'Brien, A.S.T.C., A.A.C.I.
Isabel M. Knight, B.Sc., A.A.C.I.

Laboratory Assistant: Frank M. Armer.
Laboratory Assistant: Victor Williams.
Junior Laboratory Attendant: Arthur G. Fletcher
Clerk: Grace McGlynn.
Shorthand-writer and Typist: Nellie Armstrong.

The total number of samples examined in the Chemical Laboratory during the year 1926 amounted to 19,673. This is the highest total yet recorded, the increase shown being represented in all branches of the work.

The samples submitted for the purposes of the administration of the Pure Food Act amounted to 17,157, an increase of 1,056 over the total for 1925.

Of this total, 15,921 samples consisted of milk, 3·0 per cent. of which contravened the regulation governing this article. This proportion of adulterations is the most favourable yet found, the lowest previously recorded being 3·2 per cent. of the total examined. The following figures show the improvement which has taken place within the last decade in the quality of the milk sold in the State:—

Year.	Number of Samples of Milk Examined.	Proportion of Samples Adulterated.	Year.	Number of Samples of Milk Examined.	Proportion of Samples Adulterated.
1917	8,856	6·5 per cent.	1922	13,756	4·8 per cent.
1918	10,021	7·1 ,,	1923	15,402	4·5 ,,
1919	8,076	10·8 ,,	1924	15,962	3·2 ,,
1920	12,754	8·1 ,,	1925	15,060	3·2 ,,
1921	14,612	3·2 ,,	1926	15,921	3·0 ,,

These analytical results illustrate the value of systematic inspection, and it is worthy of note that in 1919, the year of the influenza outbreak, when the services of the inspectors were for some time diverted from their ordinary duties to work in connection with the epidemic, the proportion of adulterations rose to over 10 per cent.

The milks collected in the metropolitan area in 1926 show the lowest number of adulterated samples yet recorded in the Chemical Laboratory. Out of a total of 13,497 samples examined, 2·64 per cent. were reported against as failing to conform to standard. The position in regard to country milk supplies, however, was not as satisfactory. The number of samples forwarded for examination was less than in 1925, being 2,424 as against 2,865, but the figure for adulterations was higher, being 5 per cent. of the number examined as against 3·9 per cent. in 1925. The following tables show the variation in the number of samples each month, for metropolitan and country districts, which were deficient in—(*a*) milk-fat; (*b*) solids not fat; (*c*) both milk-fat and solids not fat.

PARTICULARS of samples of milk examined in 1926 which were deficient in milk-fat and in solids not fat.

Month.	Total Samples Collected.	Proportion of Samples found to be Adulterated.			
		Deficient in Milk-fat.	Deficient in Solids not Fat.	Deficient in both Milk-fat and Solids not Fat.	Total.
Metropolitan Area.					
1926.		per cent.	per cent.	per cent.	per cent.
January	881	2·72	0·45	0·79	3·96
February	1,003	2·49	1·09	0·79	4·38
March	1,300	1·07	2·61	0·54	4·23
April	978	1·12	0·71	0·30	2·14
May	1,217	0·98	0·41	0·08	1·47
June	1,314	0·53	0·30	0·07	0·91
July	1,294	0·69	0·38	0·30	1·39
August	1,383	1·59	0·36	0·65	2·60
September	1,195	1·84	Nil.	0·75	2·59
October	892	1·68	Nil.	0·22	1·90
November	1,127	1·95	0·53	0·26	2·76
December	913	1·09	0·21	0·21	1·53
Totals	13,497	1·42	0·61	0·41	2·45

Particulars of Samples of milk examined in 1926, &c.—*continued.*

Month.	Total Samples Collected.	Proportion of Samples found to be Adulterated.			
		Deficient in Milk-fat.	Deficient in Solids not Fat.	Deficient in both Milk-fat and Solids not Fat.	Total.
		Country Districts.			
		per cent.	per cent.	per cent.	per cent.
January	126	Nil.	Nil.	0·79	0·79
February	348	1·43	3·73	1·14	6·37
March	258	0·77	2·32	4·26	7·36
April	167	0·59	Nil.	1·19	1·79
May	183	3·27	0·53	0·53	4·37
June	167	2·39	1·79	Nil.	4·19
July	122	2·45	Nil.	Nil.	2·45
August	223	3·58	Nil.	2·24	5·82
September	278	7·91	0·71	Nil.	8·63
October	185	4·86	1·08	Nil.	5·94
November	262	2·29	0·76	Nil.	3·05
December	105	2·85	Nil.	Nil.	2·85
Totals	2,424	2·84	1·19	0·99	5·03

NOTE.—In addition to the adulterations recorded above for the Metropolitan area, 5 samples of milk were artificially coloured with annatto, and 20 samples of milk were adulterated by the addition of dried milk powder, making the total proportion of adulterations 2·64 per cent. One sample of milk collected in the country contained preservative.

The number of samples other than milk examined for the purposes of the Pure Food Act amounted to 1,236, an increase of 195 over the number received in 1925. Of this number, 1,142 consisted of food substances, 25 per cent. of which did not comply with the requirements of the regulations under the Act. The following are the particulars of adulteration :—

Almonds.—6 samples were contaminated with mineral oil.

Brine.—3 samples were illegally preservatised with boric acid; 2 samples were prepared with sodium nitrite.

Butter.—8 samples contained excessive moisture; 3 samples contained excessive moisture and were deficient in fat; 5 samples were rancid.

Cheese.—6 samples were deficient in fat; 1 sample contained metallic contamination; 2 samples were deteriorated and unfit for use.

Cocoa.—2 samples contained steel filings.

Cordials.—3 samples contained an excessive amount of a permitted preservative.

Cream.—2 samples proved to be reconstituted cream; 2 samples were deficient in fat; 2 samples of bottled cream were deteriorated and unfit for use.

Essences (flavouring).—9 samples were found to be imitation essence; 1 sample was deficient in oil of lemon; 1 sample was deficient in citral.

Fish.—1 sample of "smoked" fish was artificially coloured; 7 samples of "smoked" fish were artificially coloured and contained boric acid; 2 samples of "smoked" fish contained boric acid; 2 samples of tinned fish contained formaldehyde.

Fish Pastes.—17 samples were artificially coloured; 1 sample was deficient in the proportions of the constituents declared on the label.

Flour (self-raising).—8 samples were deficient in carbon dioxide.

Fruit (dried).—8 samples contained excess sulphur dioxide.

Fruit (bottled).—4 samples contained artificial colouring and flavouring.

Fruit (fresh).—1 sample was contaminated with phenol, probably derived from the use of a spray.

Ice-cream.—12 samples contained dried milk powder; 3 samples were deficient in milk-fat.

Icing Sugar.—1 sample contained farinaceous matter.

Jam.—4 samples contained a considerable amount of apple; 1 sample was artificially coloured.

Junket Essence.—4 samples contained boric acid; 1 sample contained glycerine.

Junket Fruit Crystals.—1 sample was artificially coloured and flavoured.

Meat—Fresh.—122 samples were illegally preservatised.

Meat—Sausage.—24 samples contained an excessive amount of the permitted preservative.

Meat—Sausage.—2 samples contained boric acid.

Meat—Cooked.—18 samples were artificially coloured; 2 samples contained a prohibited preservative.

Meat Pastes.—1 sample did not comply with the labelling provision requiring the declaration of the proportion of the constituents present.

Milk—Condensed.—2 samples were deficient in milk-fat.

Mustard Paste.—1 sample was artificially coloured with a colour other than turmeric.

Pickles.—7 samples contained an excessive amount of sulphur dioxide.

Sauce.—2 samples were coloured with Armenian Bole.

Soap.—1 sample contained sodium silicate; 1 sample was deficient in fatty acids, and contained an excessive amount of carbonate of soda.

Spirits.—3 samples were below the strength required.

Tomato Sauce.—18 samples had been prepared with unsound fruit; 2 samples contained apple.

Vegetables (*tinned*).—1 sample contained excessive metallic contamination.

The most persistent form of food adulteration has been the illegal use of sulphurous acid for the purpose of preserving fresh meat. The use of any preservative substance on fresh meat (other than sausage meat), is forbidden, but although the trade has been warned that the practice must cease, over 80 per cent. of the samples examined during the year were found to contravene the regulation in this respect. The majority, if not all, of these samples formed the subject of prosecution. Eighteen out of 34 samples of tomato sauce examined were reported against as contravening the regulation in that they had not been prepared with sound fruit. The United States of America official method for the determination of the mould count was used, and, in the absence of a definite figure in our regulation, the American standard was taken as a guide.

In response to complaints that inferior food substances were being sold in the shops patronised largely by school children, a special inspection of these businesses was carried out, and samples of pastry, confectionery, &c., submitted for analysis. The analytical evidence thus obtained indicated that the complaints were not justified.

A total of 94 samples of drugs and medicines were received for analysis under the Pure Food Act, over 40 per cent. of which contravened the standards fixed. The following are the details of the adulterations:—

Bay Rum.—14 samples were deficient in alcohol, in most cases to a considerable extent.

Cod Liver Oil and Malt Extract.—1 sample was deteriorated and unfit for use.

Cough Medicines.—1 sample was deficient in the amount of alcohol stated on the label to a large extent; 1 sample failed to declare the presence of morphine.

Eau-de-Cologne.—5 samples were deficient in alcohol.

Medicated Wines.—15 samples failed to declare the proportions of the medicinal constituents present, and in the majority of cases the quantities were very much less than the minimum pharmacopœal dose.

A total of 2,516 samples of miscellaneous character were examined in connection with the Public Services of the State. Of this number, 426 were submitted by departmental institutions, subsidised charities, hospitals, &c. These consisted of food substances for examination as to conformity to tender, drugs for purity and strength, milk for control of dairy herds, infant's food and human milk submitted by baby clinics, and miscellaneous articles.

The Government Stores Department submitted 862 samples for examination for the purpose of formulation of contract standards, and for the control of the articles supplied to the various State offices. The articles thus examined included drugs, candles, chicory, disinfectants, ink and ink powders, insecticides, kerosene, linseed oil, lubricants, paints, foods, soap, turpentine, waterproof cloth, &c. A detailed list of these samples will be found in Table II.

The Pharmacy Board submitted 24 samples taken from vendors charged with selling poisons without a license.

The Police submitted 302 samples for examination in connection with criminal investigations. These exhibits included poisonous mixtures in connection with cases of suicide, foods and other substances relating to cases of attempted poisoning, miscellaneous exhibits in connection with cases of incendiarism, cocaine and morphine *re* trafficking in drugs, alcoholic liquors in cases of sly-grog selling, poison baits, exhibits of a varied character relating to charges of illegal practice and the administration of abortifacients, bank-notes *re* a charge of stealing, "dope" administered to racehorses, animal viscera, &c.

Coroners submitted 52 exhibits of human viscera and 4 exhibits of blood for examination in connection with uncertified deaths. In 30 cases the chemical examination of the viscera yielded negative results. Twelve deaths were due to strychnine, 2 each to prussic acid and morphine, and in 1 case each cocaine, paraldehyde, barbitone (veronal), barium, and nicotine was the poison found. The use of the latter for suicidal purposes is rare. In the case under notice, the deceased masticated and swallowed a sufficient number of cigarettes to cause death. In 2 cases the blood submitted was examined for carbon monoxide, in 1 case the quantity present being sufficient to indicate death from gas poisoning; in the second case the examination gave negative results. In 2 cases of death, blood from the two chambers of the heart was submitted for comparative examination with a view to determining whether death was due to drowning. In 1 case the difference in the sodium chloride content of the right and left chambers of the heart indicated death from drowning, in the second this difference was not found to exist.

Municipal, departmental, and other authorities submitted 336 samples of water for the control of country water supplies, and 122 samples of sewage and effluent for the purpose of testing the efficacy of sewage installations, and to control the discharge of offensive drainage into streets.

The authorities controlling Industrial Hygiene submitted 238 specimens for examination in connection with conditions of employment, and industrial disease or injury contracted by employees, the majority of such samples relating to applications under the Workers' Compensation Act. The detailed list of these exhibits will be found in Table II.

Miscellaneous authorities forwarded 144 samples, including drugs, patent medicines, disinfectants, various exhibits relating to alleged attempted poisoning, rubber solution, &c., &c.

Two tables are attached showing the whole of the samples examined in the Chemical Laboratory during the year.

Early in the year a conference (the first) of Commonwealth and State Analysts connected with food and drug legislation was held in Sydney. The conference, which was attended by the Federal Analyst and representatives from each of the States with the exception of West Australia, was originally called to permit of the consideration of preservatives in food, artificial food colourings, and methods of analysis.

The original terms of reference, however, were later extended to include the discussion of the whole of the standards formulated at the 1922 Commonwealth and Inter-State Conference, together with certain other questions relating to food and drug standards.

Agreement was reached in regard to suggested amendments of a number of the regulations which were considered in need of some modification, and it was unanimously recommended that such modified standards should be uniformly adopted.

With regard to those regulations which were deemed unsatisfactory, but in regard to which the conference, with the limited time at its disposal, was not in a position to propose full amendments, it was recommended that a committee consisting of three State Analysts should be appointed to go into the questions involved, collect statistics and information, and conduct such chemical investigations as may be found necessary. It was proposed that the committee, if appointed, should obtain by correspondence the co-operation of all the State Analysts, to whom its report before being finalised should be referred, and that such report should embody not only the decisions unanimously agreed upon, but also the views of any State or States dissenting from the conclusions arrived at by the majority. By this means it was thought a set of regulations would be formulated which would be uniform as regards standardisation, and also with respect to the wording and arrangement. As far as I am aware no opinion has yet been expressed regarding the advisability of appointing such a committee.

With regard to preservatives in food, the conference passed a resolution recommending that the use of boric acid as a preservative substance be prohibited after 1st July, 1928. At present the only food substances in New South Wales permitted to be preservatised with boric acid are butter, concentrated milk, and margarine. Should this recommendation be given effect to, the legislation in Australia with regard to this preservative will be in accordance with that of England. It was also recommended that the use of salicylic acid for preservative purposes be prohibited, and that benzoic acid be permitted in lieu thereof.

With regard to food colours, a revised list was proposed, and it was recommended that the permitted colours be confined to those of British manufacture.

In addition to the revision of the regulations, it was recommended that the proposed Committee of Analysts should take into consideration the advisability of prescribing standard methods of analysis, the formulation of standards for certain food substances not now provided for, and the amendment of those standards which are considered unsatisfactory from an analytical point of view.

THOMAS COOKSEY, Government Analyst.

TABLE I.—SAMPLES examined during the year 1926 for the purposes of the administration of the Pure Food Act, 1908.

Nature of Sample.	Authority submitting.	Samples.		Nature of Sample.	Authority submitting.	Samples.	
		Number examined.	Number Adulterated or Falsely Described.			Number examined.	Number Adulterated or Falsely Described.
Almonds	Food Inspectors ...	6	6	Laxettes	Food Inspectors ...	1	0
Armenian Bole	,, ...	4	0	Lemon Butter	,, ...	1	0
Baking Powder	,, ...	18	0	Meat, Fresh	,, ...	149	122
Bay Rum	,, ...	16	14	,, Sausage	,, ...	53	26
Beer	,, ...	3	0	,, Cooked	,, ...	168	20
Biscuits	,, ...	8	0	,, Paste	,, ...	6	1
Borax	,, ...	1	0	Milk, Fresh	Food Inspectors, Metropolitan District.	8,837	281
Bread	,, ...	2	0	,,	Municipal & Shire Inspectors, Metropolitan District.	4,660	76
Brine	,, ...	6	5	,,	Food Inspectors, Country Districts.	912	78
Butter	,, ...	41	16	,,	Municipal & Shire Inspectors, Country Districts.	1,512	45
Catarrhal Cream	,, ...	1	0	Milk, Sterilised	Food Inspectors ...	3	0
Cheese	,, ...	36	9	,, Condensed	,, ...	5	2
Chutney	,, ...	1	0	Mincemeat	,, ...	1	0
Cocoa	,, ...	2	2	Mustard	,, ...	5	1
Cod Liver Oil and Malt Extract	,, ...	1	1	Nut Butter	,, ...	3	0
Coffee and Chicory Extract	,, ...	1	0	Oils (Edible)	,, ...	3	0
Confectionery	,, ...	13	0	Pastry	,, ...	22	0
Cordials, Syrups, &c.	,, ...	16	3	Pepper	,, ...	2	0
Cough Medicines	,, ...	13	1	Pickles	,, ...	17	7
Cream	,, ...	35	6	Pills	,, ...	1	0
Cream of Tartar	,, ...	2	0	Preservative Powder	,, ...	2	0
Cream of Tartar Substitute	,, ...	1	0	Pudding	,, ...	2	0
Dripping	,, ...	1	0	Salad Cream	,, ...	5	0
Eau-de-Cologne	,, ...	6	5	Sauce	,, ...	17	2
Egg Pulp	,, ...	4	0	Soap	,, ...	17	2
Essences (Flavouring)	,, ...	15	11	Soup	,, ...	12	0
Fish (Fresh, "Smoked," Tinned)	,, ...	94	12	Soup Seasoning	,, ...	1	0
Fish Pastes	,, ...	26	18	Spaghetti	,, ...	2	0
Flour, Self-raising	,, ...	26	8	Spirits	Licensing Inspectors.	42	3
Fluid Magnesia	,, ...	1	0	Sulphur Bath Solution	Food Inspectors ...	1	0
Fly Spray	,, ...	2	0	Syrup (Maple)	,, ...	3	0
Fruit, Dried	,, ...	37	8	Tea	,, ...	1	0
,, Bottled	,, ...	11	4	Tomato Sauce	,, ...	34	20
,, Fresh	,, ...	1	1	Vegetables	,, ...	35	1
,, Salad	,, ...	2	0	Vinegar	,, ...	14	0
Gelatine	,, ...	1	1	Wine (Medicated)	,, ...	25	15
Ginger, Preserved	,, ...	4	0		Total	17,157	859
Honey	,, ...	7	0				
Ice Cream	,, ...	57	15				
Icing Sugar	,, ...	2	1				
Infant's Food	,, ...	3	0				
Jams and Jellies	,, ...	49	5				
Junket Essence, Tablets, &c.	,, ...	6	5				
Lard	,, ...	1	0				

TABLE II.—SAMPLES examined during the year 1926 in connection with the Public Services of the State.

Authority Submitting.	Nature of Sample.	No. of Samples.
Subsidised Charities	Barium sulphate	1
,, ,,	Bread	22
,, ,,	Butter	2
,, ,,	Calcium chloride	1
,, ,,	Cocoa	1
,, ,,	Cotton-seed meal	1
,, ,,	Curry powder	2
,, ,,	Emulsion for babies	2
,, ,,	Essences (flavouring)	3
,, ,,	Gluten meal	1
,, ,,	Linseed meal	1
,, ,,	Milk (fresh)	336
,, ,,	,, (human)	35
,, ,,	Morphine	2
,, ,,	Mustard	1
,, ,,	Oatmeal	5
,, ,,	Pepper	2
,, ,,	Sago	1
,, ,,	Sausages	1
,, ,,	Soap	2
,, ,,	Starch	1
,, ,,	Tomato sauce	1
,, ,,	Water	2
Government Stores Department.	Arsenic pentoxide	1
,, ,,	Laundry blue	2
,, ,,	Candles	8
,, ,,	Chicory	76
,, ,,	Disinfectants	132
,, ,,	Epsom salts	1
,, ,,	Ink and ink powders	121
,, ,,	Insecticides	6
,, ,,	Kerosene	1
,, ,,	Linseed oil	5
,, ,,	Lubricants	136
,, ,,	Motor spirit	1
,, ,,	Opium tincture	1
,, ,,	Paint materials	5
,, ,,	Pitch	1
,, ,,	Sago	1
,, ,,	Soap	328
,, ,,	Turpentine	3
,, ,,	Waterproof cloth	32
,, ,,	Wood preserving oil	1
Pharmacy Board	Carbolic disinfectants	13
,, ,,	Lysol and lysol substitutes	7
,, ,,	Spirits of salts	2
,, ,,	Chlorodyne	2
Police Department	Criminal investigations	302
,, ,,	Human viscera	56
,, ,,	Animal viscera	4
Municipal and Departmental Authorities.	Waters	336
,, ,,	Sewages	122
Industrial Hygiene Authorities	Air	3
,, ,,	Ammonia liquor	2
,, ,,	Dust	2
,, ,,	Enamel powder	1
,, ,,	Frit	1
,, ,,	Fumes	3
,, ,,	Leather	2
,, ,,	Lubricating grease	1
,, ,,	Paint	1
,, ,,	Rock	1
,, ,,	Water	1
,, ,,	Urine	141
,, ,,	Fæces	77
,, ,,	Viscera	2
Miscellaneous Authorities	Air	16
,, ,,	Adhesive paste	2
,, ,,	Supposed ambergris	1
,, ,,	Apricot kernels	1
,, ,,	Calcium cyanide	1
,, ,,	Caustic soda	1
,, ,,	Cordials	5
,, ,,	Disinfectants	4
,, ,,	Eau-de-Cologne	1
,, ,,	Flock	9
,, ,,	Gallstones	1
,, ,,	Invalid's food	1
,, ,,	Insecticide	1
,, ,,	Material (wool and cotton)	37
,, ,,	Methyl alcohol	2
,, ,,	Milk	1
,, ,,	Paint	2
,, ,,	Paper	1
,, ,,	Patent Medicines—	
	Liquids	5
	Ointments	3
	Pills	1
	Powders	3
,, ,,	*Re* Poisons—	
	Bread	1
	Flour	1
	Tomato spray	1
	Wallpaper	1
	Stomach lavage	1
	Vomit	1
	Animal viscera	2
	Water	4
,, ,,	Rubber solution	24
,, ,,	Soap	2
,, ,,	Soil	5
,, ,,	Spirits	3
,, ,,	Wine	1
	Total	2,516

PURE FOOD ACT, 1908.

REPORT OF THE CHIEF INSPECTOR ON THE GENERAL ADMINISTRATION OF THE PURE FOOD ACT, 1908, FOR THE YEAR ENDED 31st DECEMBER, 1926.

Staff.

Chief Inspector: ARTHUR KENCH.

Metropolitan Inspectors: Senior Inspector CHARLES V. FRANCIS, GUY A. GRIFFIN, WILLIAM H. EILBECK, ARTHUR C. PATTON, WILLIAM ALLISON, PHILLIP C. WILLIAMS, JOHN BOLTON, ROBERT FARLOW, JOSEPH H. SHIEL, FRANK BLAKE, RUPERT CUMMINS.

Country Inspectors: ROBERT HORNE, JOHN C. WILLIAMS.

Assistant: WALTER J. MADGWICK.

I HAVE pleasure in submitting a report of the work performed during the year by officers of the Pure Food Branch. The executive work under the Pure Food Act includes the supervision of all places where food or drugs are prepared, stored, or exposed for sale. Particular attention is given to the supervision of the milk supply; to the manufacture of jams, and fruit and vegetable preserving; condiments, smallgoods, and cordials; and to the general conditions of grocery, fruit, vegetable, fish, and meat shops, both wholesale and retail.

Bread Supply.—Special inspectorial work has been carried out in connection with the preparation and delivery of bread and pastry, and many bakeries have been remodelled and repairs effected under the supervision of departmental officers.

Milk Supply.—In connection with the supervision exercised over the milk supply 9,745 samples were procured by departmental officers, and submitted for analysis to the Government Analyst. Prosecutions successfully undertaken against traders who were defrauding the public by supplying adulterated milk numbered 186, and the fines and costs recovered in connection therewith totalled £750 6s.

Cream.—Thirty-nine samples were procured, resulting in three prosecutions, the fines and costs amounted to £21 4s. The adulteration in these cases consisted of deliberate addition as a preservative of formalin in some instances and calcium sucrate in others.

Ice Cream.—A special investigation was carried out in connection with the manufacture and sale of ice cream. Number of samples procured and submitted for analysis, 57; number adulterated, 15.

Meat: Preservative Substances: Use of Dusting Powders.—The question of preservation of meat has been thoroughly investigated; 215 samples of meat, including sausages, were procured and submitted to the Government Analyst for analysis; in 133 cases it was found that traders had been dusting the surface of the meat with preservative powder; 132 prosecutions were undertaken, resulting in fines and costs amounting to £335 12s.

Other Foods and Drugs.—A total of 1,170 samples of foods and drugs were submitted for analysis and 154 traders were prosecuted, the fines and costs amounted to £400 8s.

Premises Used for Preparation, Sale and Storage of Food.—Inspections were made of 11,370 premises used for, or in connection with, the preparation, sale, or storage of food. Prosecutions undertaken for unclean premises, &c., numbered 70; and fines totalled £340 18s. In addition over 1,200 notices were served on traders requiring structural alterations to premises.

Seizure and Condemnation of Unsound Food.—During the year regular supervision has been exercised over food products in wholesale and retail stores, bulk stores, auction rooms and elsewhere; over 336 tons of foodstuffs and 72,000 packages of assorted foods were found to be in a damaged and deteriorated condition; these goods were seized and destroyed; 25 prosecutions were instituted and resulted in collection of fines and costs amounting to £96 4s.

Venereal Diseases Act.—At the request of the Commissioner administering this Act special investigations were made concerning breaches of the Act.

Tables are appended showing the nature of the samples taken during the year and the class of food seized and destroyed. A detailed statement of the foods and drugs submitted for examination will be found in Table 1 of the Government Analyst's report (p. 19).

ARTHUR KENCH,
Chief Food Inspector.

TABLE I.—Summary of Work performed by Pure Food Officers for Year ending 31st December, 1926.

Milk Analysis.	Samples taken by—	
	Departmental Officers.	Municipal and Shire Council Inspectors.
Number of samples taken from all parts of the State	9,745	5,920
Number of samples below the standard	353	118
Number of warnings	167	60
Number of prosecutions	186	58
Amount of fines and costs	£750 6s.	£171 16s.

*Foods and Drugs, other than Milk.** (See Table I, p. 19.)

Number of samples taken from all parts of the State	1,170
Number of samples below the standard	182
Number of warnings	28
Number of prosecutions	154
Amount of fines and costs	£400 8s.

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*Local authorities (municipal and shire councils) do not, as a matter of routine, collect samples of food and drugs other than milk.

Food unfit for Consumption, Seized and Destroyed. (See Table II below.)

Number of prosecutions	25
Amount of fines and costs	£96 4s.

Inspection of Premises used for Preparation, Sale or Storage of Food.

Number of premises inspected in all parts of the State	11,370
Number of notices issued	1,209
Number of prosecutions	70
Amount of fines and costs	£340 18s.

General Breaches of Pure Food Act and Regulations.*

	Departmental Officers.	Municipal and Shire Council Inspectors.
Number of prosecutions	64	49
Amount of fines and costs	£197 4s.	£161 5s. 6d.

*Uncleanly habits in preparation, handling, delivery, or storage of food; use of dirty or unsuitable utensils, &c.

Summary of Legal Proceedings for Breaches of Pure Food Act and Regulations, 1926.

	Prosecutions.	Fines and Costs. £	s.	d.
Adulterated milk	186	750	6	0
Adulterated foods and drugs	154	400	8	0
Goods seized and destroyed	25	96	4	0
Unclean premises	70	340	18	0
General breaches	64	197	4	0
Grand Total	499	£1,785	0	0

Table II.—Showing nature of Food, &c., seized and destroyed by Departmental Pure Food Officers for period 1st January to 31st December, 1926.

Goods.	Quantity.	tons	cwt.	qr.	lb.	Prosecutions.	Fines and Costs. £	s.	d.
Baking powder	1,151 tins		......			...	...		
Bacon and hams	...	0	15	2	14	1	3	8	0
Barley	...	0	0	2	8	...	...		
Biscuits	...	1	0	5	20	...	...		
Breakfast foods	347 pkts.	1	13	2	27	1	5	12	0
Butter	...	2	4	3	21	1	3	8	0
Cakes	...	0	11	3	26	...	...		
Cocoa	187 tins 200 cases	11	11	2	17	...	...		
Coconuts	...	1	8	0	24	...	...		
Coffee	...	0	3	1	7	...	...		
Confectionery	...	7	14	2	26	5	13	4	0
Condiments	2,821 bot.	1	9	2	11	1	4	8	0
Cordials	9,552 bot.		......			...	...		
Cheese	605 tins 453 pkt.	2	9	3	1	1	8	8	0
Cream	97 tins		......			...	...		
Crockery	367 pieces		......			...	...		
Fish	19,609 tins	22	1	0	8	...	...		
Fish and meat paste	4,128 tins 98 jars		......			...	...		
Flour	...	2	9	0	17	1	5	8	0
Fruit	218 doz. 256 cases		......			2	5	16	0
Fruit, dried	...	164	5	1	21	6	30	12	0
Fruit, preserved	...	3	12	3	25	...	...		
Fruit pulp	...	6	5	2	6	...	...		
General groceries	3,036 tins 377 bot. 18,837 pk.	9	19	3	15	...	...		
Ginger	...	0	1	0	14	...	...		
Honey and syrup	2 bags	0	0	2	6	...	...		
Infants' food	891 tins		......			3	8	4	0
Jam	6,314 tins		......			...	...		
Macaroni	...	0	1	0	25	...	...		
Meat	355 tins	7	18	3	22	...	...		
Milk	299 tins	0	8	3	19	...	...		
Nuts	9 cases	6	1	1	1	3	7	16	0
Olives	10 cases		......			...	...		
Rice and sago	16 pkts.	1	8	2	27	...	...		
Soup	65 tins		......			...	...		
Salt	...	0	4	1	12	...	...		
Sugar	...	0	0	3	21	...	...		
Tapioca	...	78	18	3	14	...	...		
Tea	...	0	3	1	15	...	...		
Vegetables	3 cases 493 bot. 1,438 tins	0	9	0	0	...	...		
		336	6	3	22	25	96	4	0

Total—38,175 tins, 13,243 bottles, 19,653 packets, 98 jars, and 478 cases of food, and 367 pieces of crockery.

TABLE III.

SUMMARY of Work performed by Departmental Pure Food Inspectors under the Pure Food Act, 1908, from 1st October, 1909, to 31st December, 1926.

Annual Number of Milk Samples Collected.

Year.	No. of Samples Collected.	No. below Standard.	No. of Prosecutions.	Amount of Fines and Costs.
				£ s. d.
1909-10	2,155	279	185	860 5 7
1911	1,963	248	132	829 9 6
1912	2,990	436	210	1,124 4 0
1913	3,519	322	144	709 17 0
1914	3,980	291	189	837 11 0
1915	4,338	312	196	803 17 0
1916	3,013	230	115	496 17 0
1917	3,241	268	122	598 15 0
1918	4,015	371	159	774 6 0
1919	3,592	476	178	970 19 0
1920	6,022	536	243	1,697 10 0
1921	7,865	263	146	846 5 0
1922	6,702	399	140	685 12 6
1923	8,485	444	201	1,043 5 6
1924	8,805	327	149	747 13 0
1925	8,640	344	163	744 6 0
1926	9,745	353	186	750 6 0
	89,070	5,899	2,858	£14,520 19 1

Samples of Food and Drugs Collected (other than Milk).

Year.	No. of Samples Collected.	No. below Standard.	No. of Prosecutions.	Amount of Fines and Costs.
				£ s. d.
1909-10	391	49	41	150 4 0
1911	830	245	171	451 0 6
1912	593	71	71	148 17 0
1913	641	107	72	174 12 6
1914	734	135	71	321 4 0
1915	572	69	31	149 6 0
1916	557	172	50	235 12 0
1917	449	139	58	118 6 0
1918	456	131	25	48 4 6
1919	822	205	41	172 14 0
1920	1,080	207	19	65 15 0
1921	888	169	20	69 2 0
1922	758	121	17	47 3 0
1923	415	168	55	132 13 0
1924	834	166	93	348 2 0
1925	1,082	256	99	317 4 0
1926	1,170	182	154	400 8 0
	12,272	2,592	1,088	£3,350 7 6

Return showing number of Premises Inspected annually.				*General Breaches of Act and Regulations.**			
Year.	No. of Inspections made.	Prosecutions for Dirty and Unclean Premises.	Fines and Costs.	Year.	No. of Breaches.	Prosecutions.	Fines and Costs.
			£ s. d.				£ s. d.
1909-10	802	46	94 14 6	1909-10	47	36	63 9 0
1911	929	50	235 12 0	1911	67	26	57 11 0
1912	982	88	305 1 2	1912	72	60	114 8 6
1913	2,600	93	382 7 6	1913	65	40	127 0 6
1914	3,953	152	638 15 6	1914	71	42	167 7 6
1915	3,561	71	284 9 6	1915	80	55	163 15 6
1916	4,731	95	493 1 6	1916	90	21	154 8 6
1917	5,997	166	811 12 5	1917	137	47	376 16 2
1918	5,785	106	686 5 11	1918	200	131	375 12 10
1919	5,330	38	239 3 6	1919	...	60	274 2 8
1920	9,159	107	449 16 6	1920	...	83	368 2 0
1921	10,621	109	574 4 0	1921	...	113	634 10 4
1922	9,246	111	587 12 0	1922	...	72	252 19 0
1923	10 681	159	821 18 6	1923	...	119	293 4 0
1924	12,188	112	703 0 6	1924	...	47	185 1 6
1925	12,196	106	573 11 0	1925	...	66	224 5 6
1926	11,370	70	340 18 0	1926	...	64	197 4 0
	110,131	1,679	£8,222 4 0		829	1,082	£4,029 18 6

* Includes unclean methods in preparation, handling, or delivery of food; use of dirty or unsuitable utensils; storage of food in sleeping rooms, lavatories, &c.

Summary of Legal Proceedings, 1909 *to* 1926.

Year.	Prosecutions.	Fines and Costs.		
		£	s.	d.
1 Oct., 1909-31 Dec., 1910	281	1,168	13	1
1911	379	1,573	13	0
1912	439	1,693	10	8
1913	349	1,393	17	6
1914	454	1,964	18	0
1915	369	1,561	10	0
1916	371	1,457	8	0
1917	513	2,162	17	7
1918	468	2,198	9	3
1919	338	1,896	14	2
1920	452	2,581	3	0
1921	388	2,124	1	4
1922	340	1,573	6	6
1923	562	2,430	11	
1924	401	1,983	17	0
1925	455	1,948	6	6
1926	499	1,785	0	0
Total	7,058	£31,497	16	7

DAIRIES SUPERVISION ACT, 1901,

AND

CATTLE SLAUGHTERING AND DISEASED ANIMALS AND MEAT ACT, 1902.

REPORT by the Chief Dairy Inspector on the activities of the Dairies Supervision Branch, Department of Public Health, for the year ended 31st December, 1926.

Staff.

W. A. MACKIE, Senior Inspector, Camden.
S. C. FLOOD, Murwillumbah.
J. S. LYONS, Grafton.
J. LACEY, Taree.
R. A. FAUNCE, Maitland.
W. G. JOHNSTON, Casino.
F. J. MADDEN, Sydney.
V. M. NEVELL, Kiama.
F. J. PAGE, Kempsey.
C. A. JOHNSTON, Lismore.
C. A. MOFFITT, Singleton.
T. W. HANMER Tamworth.
A H. SMITH, Moss Vale.
C. H. NEPEAN, Wagga.

Number of miles travelled in inspectorial work, 88,568; dairy premises inspected, 12,657; dairy cattle inspected, 399,164. Number of dairy cattle condemned for tuberculosis, 475; actinomycosis, 131; cancer, 96; other diseases, 10; total, 712. Number of cattle submitted to the tuberculin test, 539; reacted, 46.

During the year 4,435 milch cows and 2,644 dry cows were inspected at Flemington Milch Cow Saleyards. These yards are the principal port of entry into the suburban dairies, thus affording an opportunity for a close examination of all dairy cows which are sold at this centre for the purpose of producing milk for human consumption in the city and suburbs. The health of the animals consigned for sale was satisfactory, and only one cow in the dry section was condemned for tuberculosis.

Cattle Slaughtering.—538 country slaughtering premises were inspected; beef cattle examined, 1,256; number condemned (tuberculosis), 3.

North Coast Bacon Factories.—Meat Inspectors are stationed at thefollowing North Coast centres:—O. H. Lowe and H. J. Kirkland (Byron Bay), A. J. Clogg (Lismore), G. R. McCredie, Ballina; J. Elliott, Grafton.

The number of animals slaughtered for human food, all of which were subjected to a searching post-mortem examination by the above staff is as follows:—Bullocks, 1,173 (condemned for tuberculosis, 22); cows 1,846 (tuberculosis, 69); pigs, 68,623 (tuberculosis, 1,825); calves, 1,846 (0); sheep, 3,052 (0).

Prosecutions.—163 prosecutions were instituted for breaches of the respective Acts governing the work of this Branch, and the defaulting traders were mulcted in fines and costs the sum of £605 13s. 1d.

Staff.—During the year the retirement of Mr. J. G. Bocking of Maitland, the regrettable demise of Mr. A. J. Mackie of Bega, and the serious illness of Mr. F. J. Page of Kempsey curtailed the activities of this branch to a very undesirable extent, but it is hoped in the near future that all the existing vacancies in the staff will be suitably filled, and the long-looked-for division of the upper North Coast districts, and the provision of an assistant inspector for the metropolitan area will be accomplished facts.

Owing to the lack of support accorded to the local bacon factory, it was decided not to appoint a successor to Inspector Abberton of Toorooka, who has been retired owing to reaching the age limit of the Public Service.

All the dairy cattle kept at the State Hospitals and institutions controlled by the Department have been subjected to the dual ophthalmic and subcutaneous tuberculin tests with satisfactory results, and as the young animals coming forward are the progeny of specially selected parents of the best dairy strains procurable, a considerable improvement in type and productivity is apparent.

T. V. BLOMFIELD,
Chief Dairy Inspector.

SUMMARY of the number of registered dairymen and milk vendors, and approximate number of dairy cattle on registered premises in New South Wales at 31st December, 1926, compiled from returns supplied by local authorities under the Dairies Supervision Act, 1901:—

District.	Number of Registered Dairymen.	Number of Milk Vendors.	Number of Dairy Cattle on Registered Premises.
Municipalities— Metropolitan	359	4,933	9,401
	359	4,933	9,401
Metropolitan Police	150	120	2,758
	509	5,053	12,159
Country Municipalities	2,469	997	61,516
	2,978	6,050	73,675
Police Districts	18,656	310	847,770
Total	21,634	6,360	921,445

REPORT OF THE CHIEF SANITARY INSPECTOR FOR THE YEAR ENDED 31st DECEMBER, 1926.

Inspectorial Staff.—Chief Sanitary Inspector, E. A. Cresswick, M.R.S.I. Sanitary Inspectors: T. A. W. Curry, Cert.R.S.I.; E. M. Jackson, Cert.R.S.I.; S. L. Parsons, Cert.R.S.I.; G. A. Garrow, Cert.R.S.I., S. R. Stoney, Cert.R.S.I.

Sir,

I have the honor to submit the following report on the year's work :—

Routine and General Work.

Inspection of Country Towns.—During the year systematic re-inspections of 19 country towns and villages were carried out to ascertain what action the local authorities had taken to give effect to previous recommendations in regard to improvements made by this department.

Owing to the insanitary conditions found in two of the municipalities inspected, the councils were proceeded against in the local police courts for breaches of the Acts relating to health administration.

The general conditions found, however, showed that, with a few exceptions, local authorities were giving more responsible consideration to the advice and recommendations issued by the department.

Seven towns were inspected for the first time, and recommendations forwarded to the local authorities concerned with regard to general improvements and sanitary requirements, sanitary and garbage services, structural alterations to dwellings, closets, stables, &c.

Thirteen outbreaks of infectious diseases in country towns and districts were investigated, probable causes located, reports submitted, and necessary action indicated to local authorities.

Sanitary and Garbage Depots and Sites.—102 sanitary and garbage depots were inspected; 55 proposed sites were also visited, and reports submitted as to their suitability or otherwise. In several instances depots were found to be in a very insanitary condition, pans not properly cleansed or steamed, and nightsoil left exposed for indefinite periods, owing to laxity of supervision by local authorities. In 5 instances legal proceedings were instituted against contractors and local authorities.

In every case where laxity of supervision was evident, local authorities were notified to have the work carried out in accordance with Local Government Ordinances, and informed that unless satisfactory improvements were effected, this Department would be compelled to take action to enforce compliance. In the majority of instances re-inspections revealed definite improvement in the methods adopted for the disposal of garbage and nightsoil.

Four new garbage services were installed and two sanitary services placed in efficient working order as a result of notices issued under the provisions of section 3 of the Public Health (Amendment) Act, 1915.

Insanitary Dwellings.—During the year 226 insanitary dwellings were inspected; 102 were found to be in such a condition as to be unfit for human habitation or occupation, and certificates under the provisions of section 16 of the Public Health (Amendment) Act, 1915, were issued to local authorities recommending closure of the buildings.

A considerable proportion of the premises inspected required extensive improvements to bring them into conformity with Local Government ordinances, although they were not in such an advanced state of disrepair as to be unfit for occupation.

Inspections of insanitary dwellings, and reinspections to ascertain whether necessary action has been taken to have premises placed in a habitable condition, make heavy demands on the time of officers of this branch, and considerable expense is incurred in carrying out the work. Such inspections are only required by local authorities who are without the services of a certificated inspector, and it would appear desirable that the appointment of qualified inspectors should be made mandatory on local authorities. The insanitary conditions found in districts unprovided with a trained inspector should be ample evidence of the need for such action. The Queensland system, under which district health inspectors are appointed by the Commissioner of Public Health, is reported to be satisfactory.

Homebush Abattoirs.—Sixty-three inspections were made of the by-product plant and premises at the State Abattoirs. Comparatively few complaints were received during the year. The plant has been maintained in efficient order, and with the improved methods now adopted for the treatment of wastes and offal, the offensive odours have been reduced to a minimum.

General Inspections.—Other matters investigated comprised inspections and reports relating to 197 septic tanks and sites for same; 45 general complaints of nuisances; 15 sanitary services; 10 garbage services; 13 aborigines and other camps; 228 noxious trade premises; 34 slaughter-houses; 147 butchers' shops and other food premises; 369 unhealthy building lands; 16 public hospitals; 33 private hospitals, new and existing; 23 public and 9 private schools; 119 theatres and public halls; 9 dairies; 6 cemeteries; 11 barbers' shops; 15 wharves and ferries; 24 showgrounds and racecourses; 11 country water supplies 6 government and public buildings; 24 bedding factories; 47 drainage complaints; 5 chemical closets; 3 smoke nuisances; 12 new scavenging districts; 3 public baths and sheds; 1 cyanide fumigation.

Plans, &c., Examined or Prepared.—This work comprised plans of 3 septic tanks, 64 plans or tracings of unhealthy building areas, and 4 draft proclamations of such areas; examination of 168 plans for septic tanks submitted by municipal and shire councils for approval; and 12 plans of new hotels submitted by licensing benches.

Pollution of Rivers, Harbour, and Watercourses.—Numerous inspections were carried out and investigations made into the alleged pollution of rivers and watercourses, particular attention being given to Cooks River, Parramatta River, Botany Bay, George's River, Haslam Creek, Duck Creek and Homebush Bay in the vicinity of Sydney, and to other places where effluent from sewage disposal works was allowed to flow into rivers.

Thirty samples of water, sewage, excreta and septic tank effluent were collected and submitted to the chemical or microbiological laboratories for examination.

Water Supply and Sewerage Schemes.—Eleven water supplies and storage reservoirs were inspected and reported upon, and 3 sewerage systems were investigated with regard to the possible pollution of rivers and streams in the neighbourhood.

The importance of water supply and sewerage schemes in relation to the health and comfort of residents of small country towns does not appear to be sufficiently realised by many local authorities. There are 95 towns with a population exceeding 1,000 which are without a public water supply, and 91 towns with a population of 2,000 which are without sewerage. As both these services are not only conducive to the health and convenience of the community, but can be made valuable reproductive assets, it is considered that the installation of such systems might be made mandatory in towns with a population above the figures quoted if the installations are reported to be reasonably practicable by a qualified engineer. The Victorian Act dealing with water supplies and sewerage provides that on receipt of a petition from a majority of persons liable to be rated the local authority shall make application for the installation of a sewerage system for the area concerned.

Ferry Steamers and Jetties.—Special attention has been given to the sanitary accommodation provided on ferry steamers and jetties. On a number of the ferry steamers up-to-date sanitary fittings have been installed with satisfactory results.

Additional sanitary accommodation has also been provided on the jetties, and during the year complaints in this regard have been negligible.

Manufacture and Remaking of Bedding, &c.—Ten samples of flock and other materials were taken and submitted for examination as to compliance with requirements.

Since the gazettal on 22nd October, 1926, of regulations (see p. 28) governing the manufacture, renovating and remaking of bedding, cushions, upholstery, &c., special attention has been given to the premises where such work is carried on. Numerous tests have been made for the purpose of ascertaining the type of 'apparatus which should be installed for the proper cleansing and disinfection of the materials used, and also for the collection of dust arising during teatment, but complete results had not been obtained at the end of 1926.

The insanitary condition of a largeproportion of the used bedding sent to manufacturers for remaking constitutes a danger to the health of operatives and the public, and demands systematic supervision, summary action for breaches of the regulations, and additional power to deal with storage, sale, &c., of such articles.

Damp-proof Courses for Buildings.—Several samples of material for damp-proof courses were submitted for approval by the Board of Health in accordance with the provisions of Local Government Ordinances 70 and 71, and were sent to the testing branch of the Public Works Department. Two samples were approved, and the remainder were rejected as being unsuitable.

In making inspection of buildings in course of erection in several country towns, it was found that inferior materials for dampcourses were still being used. The attention of the councils concerned was drawn to the provisions of Ordinances 70 and 71, and they were advised not to allow the use of any materials unless they were specified in the Ordinance or had been approved by this Department. A list of approved materials was forwarded to the local authorities concerned.

New Ordinances.—During the year five new ordinances relating to public health matters were submitted to this department in accordance with the provisions of the Public Health (Amendment) Act, 1915. The drafts were checked, and in some instances alterations or amendments were recommended.

The amendments to existing ordinances have had the effect of strengthening sanitary administration and simplifying the enforcement of improved conditions.

Sanitation of Hotels.—Seventy-four hotels were inspected and reports and recommendations in regard to them submitted to the Department of the Attorney-General and Justice. Matters dealt with in the reports were structural defects, ventilation, lighting, cubic space, cleanliness, maintenance, disposal of wastes, drainage and general sanitary conditions.

The recommendations specified desirable alterations and indicated the action necessary to remedy unsatisfactory conditions. These reports and recommendations are forwarded for the information of the Licensing Reduction Board and Licensing Court.

Special inspections of hotel premises have also been carried out at the request of the police with a view to supplying expert evidence to the Licensing Court when applications for renewal of license or objection by the police to the renewal of license are being dealt with.

Septic tanks are being installed at many of the important hotels in country districts, partly as the result of action by the Licensing Reduction Board. Electric lighting plants and hot-water systems are also being installed. These permanent services afford greater comfort and convenience, and are greatly appreciated by the travelling public.

Although it was found necessary during the year to institute legal proceedings against four hotel-keepers on account of insanitary premises, it is gratifying to note a marked improvement in the general condition of hotel premises.

Special mention might be made of the proposed new hotel ordinance which has been checked and revised on several occasions. The application of this ordinance will fulfil a very definite need and should enable the authorities concerned in hotel licensing to secure effective renovation of existing buildings in regard to structure and sanitation, and to improve the type of new hotels.

Chemical Closets.—No chemical closets were submitted for testing during the year, but inspections have been made of this class of fitting in country centres.

In private dwellings these fittings are usually found to be working satisfactorily, and have been the means of reducing nuisance from offensive smells and flies. The results in public buildings where it is impracticable to maintain close supervision are not as satisfactory, in consequence of misuse by a certain element of the public.

Theatres and Public Halls.—During the year 119 inspectons and re-inspections were made of theatres and halls, and several complaints were investigated. In addition, special attention was given to public halls in country districts. The decrease in the number of inspections as compared with the preceding year (223) is mainly due to the extra travelling involved. Where necessary reports were forwarded to the Chief Secretary's office recommending improvements.

The interest of local authorities in the proper maintenance of public halls has been considerably strengthened by the visits of inspection, and usually where re-inspections were made considerable improvement in relation to cleanliness and sanitation were noticeable, and greater regard given to the comfort and convenience of the public.

Numerous air tests were made with the katathermometer and other apparatus in theatres and public halls during performances for the purpose of acquiring information in regard to air movement, humidity and temperature. The results are incorporated in the Industrial Hygiene section on p. 49. It is intended to establish a standard of ventilation for public halls in the near future.

Routine Destruction of Rats.—During the year the whole of the water-front from Woolloomooloo Bay to Blackwattle Bay was systematically trapped and poison baits were laid by departmental and other rat-catching staffs; 1,114 rats and 229 mice were caught by the rat-catching staff attached to this Branch and examined in the Microbiological Laboratory. All were free from plague.

The steady decrease in the number of rats caught on the water-front results from the improvement in wharf construction, rat-proofing of buildings, steaming operations under and around the wharves, and the vigilance displayed by the Sydney Harbour Trust sanitary and rat-catching staffs, and the systematic fumigation of vessels.

Prosecutions.—During the year the following prosecutions were instituted and conducted by Departmental officers for breaches of various public health enactments in country districts.

Act under which information was laid.	No of Prosecutions.	Amount of Fines and Costs.
		£ s. d.
Pure Food Act, Regulations	13	125 11 4
Ordinances, under Local Government Act, 1919	17	98 15 9
Totals	30	224 17 1

In a number of other cases breaches of Acts or Ordinances were pointed out to councils for action, and in such cases the inspecting officer attended the court and gave evidence in support of the prosecution.

Noxious Trades.—The desirability of setting apart about 3,000 acres of land as a noxious trades site outside the metropolitan district is receiving attention, and several areas are under consideration. The extension of settlement and increasing value of suburban land has rendered unsuitable many of the existing sites used by noxious traders.

228 noxious trades premises were inspected during the year, and general improvement of methods was noticeable. About 500 licenses were issued, and several applications were refused; 2 unregistered traders were required to reconstruct their premises in conformity with the regulations and to obtain licenses.

Advice was given to local councils and others in regard to sites, plant, appliances and methods, and the layout and erection were supervised when necessary.

Dry-rendering plants for the treatment of slaughter-house wastes were erected at three of the larger fat-extracting and manure-making premises. Use of this type of plant has resulted in the elimination of offensive vapours as well as the great amount of " soup " and other offensive liquid wastes produced by the earlier methods. Many inquiries have been made in regard to this method and other improvements in apparatus, and traders in the more populous areas are encouraged to instal the improved types.

PUBLIC HEALTH (AMENDMENT) ACT, 1921.

Regulations re Rags, Flock, and Bedding, &c.

1. No person shall collect, deliver, or offer for sale or sell rags from any refuse or garbage or from any receptacle or vehicle used for the storage or collection of refuse or garbage, or from any garbage tip, to be utilised for the manufacture of flock.

2. No person shall receive, store, or deliver rags which are unclean or which have been collected from refuse or garbage, or from any receptacle or vehicle used for the storage or collection of refuse or garbage, or from any garbage tip.

3. No person shall make flock from rags which are unclean or which have been collected from any refuse or garbage, or from any receptacle or vehicle used for the storage or collection of refuse or garbage, or from any garbage tip.

4. Every person carrying on any trade, business, or calling which involves any process of teasing, shaking, or renovating hair, fibre, kapok, flock, or other material which has been used in mattresses, beds, pillows, cushions, or upholstery, shall provide apparatus of a class approved by the Board of Health for such process, and shall cause the dust arising from such process to be effectually caught, collected, and disposed of in such a manner as not to be a danger to health, or to cause a nuisance of any kind.

E. A. CRESSWICK,
Chief Sanitary Inspector.

PRIVATE HOSPITALS ACT, 1908.

Report on the operation of the Act for the year ended 31st December, 1926, by F. M. Suckling, M.B. Ch.M., D.P.H. (Syd.), D.T.M.&H. (Cambridge), Assistant Medical Officer of Health.

There were at the close of the year 637 licensed hospitals throughout the State (metropolitan area, 263; country districts, 374), an increase in the number at the corresponding period last year of 17 (metropolitan, increase 11; country increase, 6).

The metropolitan area for the purposes of this report is that as shown in the map published in the New South Wales Railway Time-table, the remainder of the State being included in the term "Country Districts."

Inspection of Private Hospitals.—This was carried out on lines similar to those indicated in former reports, *i.e.*, all premises prior to issue of license were inspected either by departmental officers or the police and reinspections of those licensed were carried out as circumstances permitted, both in the metropolitan area and the country.

In connection with primary inspections of dwellings proposed to be used as private hospitals, I had occasion to bring under the notice of the Board of Health the question of a possible review of standards for the cubic capacity and height of rooms, since the provisions of Ordinance 70 of the Local Government Act were beginning to assert themselves throughout the State. The following extracts from my report submitted to the Board are explanatory of the position which had arisen :—

> "There is no actual regulation in force dealing with the size and cubic capacity of rooms which are to be used by patients in private hospitals, but hitherto the Department has adopted a working minimum standard of 1,000 cubic feet per patient, calculating with a height basis of 10 to 12 feet (*i.e.*, floor area could vary from 83⅓ square feet to 100 square feet).
>
> Private hospitals are buildings but rarely erected for that specific purpose, being private dwellings adapted for hospital use. Up to the present the above standard has been a workable one, but the situation is now undergoing a change in view of the fact that the provisions of Ordinance 70 of the Local Government Act are beginning to assert themselves with respect to height and cubic capacity of air space, and this will affect the question of recently erected dwellings relative to their suitability for private hospitals, if the old standard is to be retained.

Clauses 20 and 21 of Ordinance 70 are as follows :—

20. Every person who shall erect a building shall provide that—

(*a*) the areas of the floors of all the habitable rooms in such building shall, taken together, average not less than 100 square feet per habitable room;

(*b*) a habitable room shall not in any case have a floor area of less than 80 square feet; and

(*c*) a habitable room shall not, in any case, have a cubic space of less than 720 cubic feet measured below 9 feet in height: Provided that in each dwelling-house and in each flat of a residential flat building there shall be at least one habitable room the cubic space of which shall be not less than 1,296 cubic feet measured below 9 feet in height.

21. (*a*) Every habitable room which is wholly or partly in the roof of a building shall, in the case of an attic room above the ground floor, be for at least two-thirds of the area of the floor not less than 9 feet in height, and shall not in any part be less than 5 feet in height; and, in the case of any other room, shall be for at least three-fourths of the area of the floor not less than 9 feet in height, and shall not in any part be less than 7 feet 4 inches in height.

(*b*) Every habitable room which is not a room wholly or partly in the roof of a building shall be not less than 9 feet in height: Provided that bays, inglenooks, and recesses for furniture may be added to such rooms with ceilings of a less height than 9 feet, but the ceilings of such bays and inglenooks shall not be less than 6 feet 8 inches in height.

It is realised, of course, that with the reduction of permissible height to 9 feet, due provision under the Ordinance has been made for lighting and ventilation.

I now desire to submit for the Board's consideration the question as to whether allowance is to be made for the provision of this Ordinance in dealing with private hospitals in the future.

I submit for the Board's information the following data relative to private hospitals standards elsewhere :—

Victoria.—Standard per patient prescribed by regulation—1,000 cubic feet of air space with area per bed of 100 square feet and a minimum height of 10 feet. (Infectious cases must have 120 square feet and 1,200 cubic feet).

Western Australia.—Minimum : 1,000 cubic feet of air space per bed; 100 square feet area per bed; 8 feet of lineal wall space per bed.

England.—The Ministry for Health issued a memorandum for maternity homes and hospitals as follows :—

Patients with infants—a basis of 90 square feet, height 10 feet, and cubic capacity of 960 feet.

If mothers only are in the wards—80 square feet allowed, height 10 feet.

Ante natal cases—60 square feet allowed, height 10 feet.

According to standard plans for public hospitals in New South Wales, the following are usually adopted:—

General wards, 112 square feet; maternity wards, 103 to 104 square feet; height, usually 12 feet. Eight feet lineal wall space is allotted per bed, *i.e.*, beds must be 5 feet apart.

I think if the standard for private hospitals is to be amended in any way, particular attention might be directed to a minimum superficial floor area per bed, *e.g.*, 100 square feet."

The Board resolved to adhere to the standards hitherto adopted by the Department, but decided that any application which involved a departure from such should in the future be dealt with on its particular merits.

In the routine departmental reinspections of hospitals made during the year, those in the following country towns were reported upon:—Broken Hill, Forster, Inverell, Mudgee, Tuncurry, Wagga Wagga and Young. In most instances these reinspections disclosed a satisfactory state of affairs, although occasionally drainage nuisances and minor technical faults in keeping the hospital registers were noted.

Community and Public Activities in connection with Private Hospitals.—It is satisfactory to note the continued activities of the Bush Nursing and Country Women's Associations in lending support to the establishment of small hospitals in the more remote districts of the State. The Bush Nursing Association was responsible for seven licensed hospitals during the year, and in addition the Country Women's Association established a maternity hospital at Hillston and has others under consideration. A community effort at Delegate resulted during the year in the opening of a cottage hospital to serve that district. This hospital is at present licensed under the Private Hospitals Act.

Exemptions.—Exemptions owing to remoteness were granted either primarily or by way of renewal to five hospitals during the year, viz., at Wentworth, Mount Hope, Goodooga, Numeralla and Rye Park, but those at Goodooga and Rye Park subsequently closed during the currency of their exemptions.

The Nurses' Registration Act, 1924.—This Act has had some effect on private hospital matter during 1926, and its provisions are likely to be still further felt in the forthcoming year, *e.g.*, two applications for renewal of license could not be recommended as the resident managers of such hospitals had failed to obtain State registration as nurses, thus rendering themselves ineligible for continued approval under the Private Hospitals Act; other licensees voluntarily closed their hospitals for the same reasons on expiry of their licenses; others again who hitherto had held licenses conditionally for the reception of certain classes of cases were called upon to limit reception of patients to that kind only for which they were registered to nurse, unless they could secure an assistant registered nurse who was eligible to attend the other complementary class of patient.

Sepsis connected with Pregnancy.—Ten cases were reported during the year. Seven occurred in the metropolitan area, one each at hospitals in Marrickville, Lane Cove, North Sydney, Ashfield, Belmore, and two at one hospital at the Glebe. Three were reported from country hospitals, viz., one at Woodstock and two from a hospital at Gundagai. Those in the metropolitan area were made the subject of special departmental inquiry, and it was interesting to note that two of them were at first diagnosed as cases of scarlet fever, two of the cases were primiparæ and five multiparæ and delivery was instrumental in only one case. It is to be noted that the number of cases of sepsis reported from the metropolitan area exceeds that from country districts. All of the cases occurred in hospitals licensed to receive lying-in cases alone and the nurses in attendance were all duly certificated.

Apart from the restrictions which are placed on hospitals by the Private Hospitals Act when a case of sepsis occurs, *i.e.*, the temporary closing of the premises, the nurse must also satisfy the Nurses Registration Board that she is not liable to convey infection. These precautions will, no doubt, prove of benefit in preventing the spread of further trouble.

Assistance rendered by other Departments.—The thanks of the Department is due to both the Commissioner of Police, the Registrar of the Nurses Registration Board and their officers for their assistance in the administration of the Private Hospitals Act.

Comments on Table I to III attached:—

Table I.—As indicated in this table lying-in hospitals as hitherto comprise the largest proportion of licensed premises in the State, being 57 per cent. of the total.

Table II.—The number of hospitals containing from 4–10 beds still comprises the largest proportion of licensed premises, being almost 44 per cent. of the total (a slight decrease in that of the previous year). There has been a tendency towards an increase in hospitals with larger numbers of beds, those containing from 11 beds and over constituting now 21 per cent. of the total as compared with 19 per cent. last year.

Table III.—This table indicates that the number of uncertificated nurses in charge of private hospitals has still continued to fall, in spite of a slight increase in the total of licensed premises. At the close of the year there were 53 such nurses (metropolitan 1, country 52) as compared with 56 in the year 1925 (metropolitan 1, country 55).

In the forthcoming year it will become finally necessary that all nurses who are to act as resident managers must first secure State registration, since section 10 of the Private Hospitals Act has been amended in conjunction with the provisions of the Nurses Registration Act, 1924.

F. M. SUCKLING,
Assistant Medical Officer of Health.

TABLE I.—Showing the Classification of Private Hospitals Licensed at 31st December, 1926, according to Nature of Cases received and the total number of beds provided by each class of hospital.

	Medical, Surgical, and Lying-in.		Medical and Surgical only.		Lying-in.		Total.	
	No. of hospitals.	No of beds.	No. of hospitals.	No. of beds.	No. of hospitals.	No. of beds.	No. of hospitals.	No. of beds.
Metropolitan District......	79	1,639	26	443	158	676	263	2,788
Country Districts	147	1,353	17	224	210	800	374	2,377
Total	226	3,022	43	667	368	1,476	637	5,165

TABLE II.—Showing Classification of Private Hospitals with respect to size as signified by Number of Beds available.

	1	2	3	4–5	6–10	11–20	Over 20.	Total.
Metropolitan District......	14	38	29	45	58	45	34	263
Country Districts	22	50	68	66	111	46	11	374
Total	36	88	97	111	169	91	45	637

TABLE III.—Showing Classification of approved persons responsible for the nursing and management of Patients.

	Duly Qualified Medical Practitioners.	Certificated Nurses.	Uncertificated Nurses.	Total.
Metropolitan District.........	2	260	1	263
Country Districts	10	312	52	374
Total	12	572	53	637

MEDICO-LEGAL SECTION, &c.; HOSPITAL ADMISSION DEPOT.

REPORT OF THE GOVERNMENT MEDICAL OFFICER FOR SYDNEY FOR THE YEAR ENDED 31st DECEMBER, 1926.

Medical Staff.

Dr. Arthur Palmer, Government Medical Officer for Sydney; Dr. A. E. Gibbes, Second Government Medical Officer for Sydney; Dr. R. M. Mackay, Third Government Medical Officer, Sydney.

Depot Staff.

Daniel Frazer Heyward, Senior Attendant; William G. Jones, Depot Attendant; William Clarke, Escort Attendant.

Sir,

I have the honor to present herewith a brief review of the work carried out by Dr. Tooth (on the transference of Dr. Gibbes to the State Insurance Department) and myself during 1926.

Medical Work at Hospital Admission Depot.

Examination of Indigent Sick Persons.—The Government Medical Officers attend at the Hospital Admission Depot every morning from 9 a.m. to 12·30 p.m. to examine indigent sick persons seeking admission to the various hospitals and institutions. During 1926, 17,425 persons were sent to the State Hospitals and Asylums, or to one or other of the Metropolitan hospitals or convalescent homes. The sick poor who are unable to attend at the depot are seen at their homes, and arrangements made for their transfer to a suitable institution.

Medical Examinations for Public Services, &c.

Examinations for the Public Service Board.—The Hospital Admission Depot is utilised for the examination of some of the candidates for admission to the Public Service, and there were 368 examinees under this heading during the year. Other examinations of public servants were in cases of applications for retirement before 60 years through physicial incapacity or other medical reasons, and their re-examination each year; or to ascertain the fitness of officers to continue on duty between the age of 60 and 65 years. Special medical examinations are also occasionally required in connection with other Service matters.

Medical Examinations of Police Staff.—473 persons applying for admission to the police force were examined during the year, and 100 probationary constables were re-examined on completion of twelve month's service. Candidates for appointment to this important service are first examined at the Hospital Admission Depot, and, after twelve months' service, are re-examined at the office of the Inspector-General of Police. At my rooms in the Police Department, members of the police force on the sick list are seen daily, and other matters arising in connection with this service are attended to. During 1926 there was an average daily number of 46 police on sick report as compared with 44 for 1925.

Other Public Services.—Other work for public services included the examination of pilots for the Navigation Department.

Vaccinations.—346 persons were vaccinated at the Hospital Admission Depot; most of these were members of the police force.

Medical Examinations required by the Factories Act are also made by the Government Medical Officers; there were 3,860 such examinations in 1926.

Examinations for Legal Aid Office.—The work of the Legal Aid office carried out at the Hospital Admission Depot has lately decreased—possibly only temporarily.

Medico-legal Work.

Cases of alleged Rape and Criminal Assault.—In these cases it is desirable that the persons concerned should be examined with the least possible lapse of time, and urgent calls by the police are frequent at all hours of the day and night in connection with such charges. During 1926, 63 persons were examined in connection with such cases, and there were 40 examinations of clothes and other exhibits in criminal cases.

Suicides, Murders, and Violent or Uncertified Deaths are medico-legal matters which required immediate attention by this Branch. The work for the Coroner's Court in 1926 in connection with such cases comprised the external examination of 149 dead bodies, the making of 190 internal post-mortem examinations, and the giving of evidence at 103 inquests. In several instances evidence was subsequently given at the Central Criminal Court.

In connection with medico-legal cases, all exhibits of clothing, implements, &c., in cases of murder, rape, and assault, are submitted to this Branch before being sent on to the Microbiological or Chemical Laboratories for examination.

Medical Examination of Accused Persons.—A number of examinations were made of accused persons under the arrangement by which persons charged with capital or other serious offences are medically examined as soon as possible after arrest.

Examinations had also occasionally to be made to ascertain the fitness of prisoners to travel to Long Bay.

Lunacy Cases.—The Reception House at Darlinghurst was visited daily throughout the year for the purpose of examining persons under detention there, and 756 persons (431 males and 325 females) were certified as insane.

In conclusion, it may be added that the medical officers attached to this Branch are on duty at all hours, and are liable to be called upon at any time by any court of law or deparment of the State Government for work requiring general medical knowledge.

Workers' Compensation Act—Two experienced and valued medical officers attached to this Branch (Dr. A. E. Gibbes, second Government Medical Officer, and Dr. R. M. Mackay, third Government Medical Officer) have been engaged for some months on work arising in connection with the Workers' Compensation Act.

ARTHUR A. PALMER,
Government Medical Officer for Sydney.

SECTION I.—B.

Communicable Diseases.

PAGE

1. Notifiable Infectious Diseases recorded in New South Wales during the year ended 31st December, 1926, and Graphs 34

2. Venereal Diseases Act, 1918; Sixth Report by the Commissioner (Dr. Robert Dick) for the year ended 31st December, 1926 43

B.—COMMUNICABLE DISEASES.

1.—NOTIFIABLE INFECTIOUS DISEASES RECORDED IN NEW SOUTH WALES DURING THE YEAR ENDED 31st DECEMBER, 1926.

The Public Health Act, 1902, Part III.

This Act provides that the Governor may, by Proclamation in the *Government Gazette*, declare that any disease therein named is an infectious disease. Encephalitis lethargica was proclaimed on 1st April, 1926, and at the end of the year the ordinarily notifiable diseases under the Public Health Act of 1902 were :—

	Notifiable from—	Cases and Deaths Notified.					
		1924.		1925.		1926.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Typhoid fever and paratyphoid	1st January, 1898	768	97	533	80	698	80
Scarlet fever	,,	3,421	29	3,043	27	4,755	53
Diphtheria or membranous croup	,,	4,364	222	3,004	118	3,579	147
Bubonic plague	23rd January, 1900	...	...	...	...	...	...
Infantile paralysis (acute anterior poliomyelitis)	1st February, 1912	108	6	57	14	81	21
Epidemic cerebro-spinal fever (meningococcal meningitis)	11th October, 1915	29	38	37	27	32	23
Encephalitis lethargica	1st April, 1926	...	...	...	...	...	33*
	Total	8,690	392	6,674	266	9,145	357
	Population at 31st Dec.	2,256,649		2,300,081		2,349,401	

The number of cases of the above diseases notified in each district in 1926, deaths therefrom, and age and seasonal incidence are shown in Tables I-VI., pp. 35–42. Pulmonary tuberculosis is notifiable under the Public Health (Amendment) Act, 1915. (See below.)

As will be seen by the increase of notifications from 6,674 in 1925 to 9,145 in 1926, infectious diseases were prevalent during the year.

Typhoid Fever.—Although the number of cases notified is the second lowest on record, the figures show an increase of 165 cases over 1925, the year of lowest incidence.

Scarlet Fever continued in epidemic form, 4,755 cases being notified compared with 3,043 cases in 1925, an increase of more than 1,700 cases.

Diphtheria was also prevalent, 3,579 cases being notified, an increase of more than 500 cases on the figures (3,004) for 1925.

Infantile Paralysis.—81 cases were notified, as against 57 cases in 1925. The highest incidence was in January and February, more than half the cases being notified in those months. This is contrary to previous experience, April and May usually being the months of highest incidence.

**Encephalitis Lethargica* was made a notifiable disease on 1st April, 1926. No cases were notified during the year; 33 deaths from this disease are recorded by the Government Statistician.

Dengue Fever occurred in epidemic form in parts of the northern and north-western districts, and a report on the outbreak appears on pages 99 and 154. Dengue fever is not a notifiable disease in this State.

Bubonic Plague.—No case of plague was reported in 1926. Systematic rat-trapping was continuous, and no plague-infected animals were found. Detailed statements in regard to bacteriological examinations of rats are given in Part IV, p. 144.

Smallpox.—No case of smallpox was reported in this State during 1926.

Leprosy.—The thirty-sixth Annual Report on Leprosy in New South Wales will be found in Section III (p. 121). At the end of 1926 there were 15 lepers under detention. Medical practitioners attending or becoming aware of cases of leprosy or suspected leprosy are required to notify the cases, in writing, under Part III, Division 2, of the Public Health Act, 1902.

Pulmonary Tuberculosis.—Public Health (*Amendment*) *Act,* 1915.

Tuberculosis was made notifiable in the City of Sydney on the 18th October, 1904, under by-laws passed by the Sydney Municipal Council for the purpose. These by-laws required that medical practitioners should notify all cases of pulmonary tuberculosis, occurring within the city area, seen or attended by them. A return of the cases notified within the City of Sydney from 1st January, 1905, and subsequently under the Public Health (Amendment) Act, 1915, is shown in Table VI (p. 42).

By proclamation under the Public Health (Amendment) Act, 1915, pulmonary tuberculosis was made notifiable in the Metropolitan and Hunter River Combined Sanitary Districts from 11th August, 1915; in the Katoomba Municipality and Blue Mountain Shire from 2nd October, 1916; and in the Blackheath Municipality from 17th December, 1920; at present it is not notifiable elsewhere in the State.

Venereal Diseases Act, 1918.

This Act was passed at the end of 1918; its provisions remained in abeyance until brought into operation by issue of a proclamation on 1st December, 1920. The steady progress made is recorded in the Sixth Annual Report of the Commissioner (Dr. Robert Dick), p. 43. Total Notifications for 1926, 6,001.

Table I.—Showing the number of Notified Cases of, and Deaths from, the following diseases:—Cerebro-spinal Fever (Meningococcal Meningitis), Diphtheria and Membranous Croup, Infantile Paralysis (Acute Anterior Poliomyelitis), Scarlet Fever, Typhoid Fever (including Paratyphoid), and Pulmonary Tuberculosis—in the Metropolitan Combined Districts for the year ended 31st December, 1926.

District.	Typhoid Fever and Paratyphoid.		Scarlet Fever.		Diphtheria.		Infantile Paralysis.		Cerebro-spinal Meningitis.		Pulmonary Tuberculosis.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths
Metropolitan Municipalities.												
Sydney (City of)	20	6	177	...	147	39	8	8	2	9	166	107
Alexandria	...	...	21	...	19	...	...	...	...	...	9	3
Annandale	2	...	27	...	31	...	...	...	...	...	10	3
Ashfield	2	...	116	...	62	...	1	1	2	1	42	12
Balmain	4	...	118	...	43	1	...	...	1	...	23	6
Bexley	2	...	73	...	21	...	...	...	...	...	12	6
Botany	1	...	19	...	19	...	1	...	...	...	3	1
Burwood	5	...	78	...	44	1	2	...	...	...	9	7
Canterbury	13	...	217	1	116	...	9	...	1	...	42	17
Concord	1	...	39	...	46	...	...	...	...	...	15	5
Darlington	...	...	...	...	...	...	...	...	...	...	4	1
Drummoyne	1	...	51	...	31	1	...	...	...	...	15	...
Eastwood	1	...	4	...	2	...	...	...	...	...	7	4
Enfield	3	...	56	...	32	...	...	...	1	1	3	2
Erskineville	3	...	8	...	6	...	1	...	...	...	5	1
Glebe	5	...	48	...	43	...	2	...	2	...	20	6
Homebush	...	...	9	...	6	...	...	...	...	...	8	2
Hunter's Hill	26	...	53	...	3	...	...	...	...	...	6	6
Hurstville	6	...	67	...	29	...	...	...	...	...	17	7
Kogarah	3	2	73	...	45	...	1	...	...	...	20	12
Lane Cove	11	...	27	...	15	...	...	...	...	...	10	3
Leichhardt	...	1	78	1	52	1	...	...	...	1	18	20
Manly	5	1	25	...	35	1	...	...	...	...	7	6
Marrickville	9	...	133	...	76	...	1	...	...	...	19	10
Mascot	12	...	58	...	19	...	1	...	...	...	9	2
Mosman	5	...	35	...	11	...	2	1	...	...	8	4
Newtown	6	...	59	...	47	...	1	...	...	...	35	8
North Sydney	11	...	108	1	52	...	...	...		...	31	16
Paddington	4	...	75	...	49	...	1	...	...	...	30	8
Petersham	5	2	69	...	29	...	2	...	...	1	22	12
Randwick	10	5	131	39	87	13	2	...	...	...	133	88
Redfern	6	...	36	...	55	1	...	...	...	...	23	6
Rockdale	10	1	119	...	61	...	1	...	...	...	12	8
Ryde	10	...	56	...	36	...	2	...	...	...	12	8
St. Peters	1	...	39	...	27	...	2	1	1	...	9	2
Strathfield	1	1	50	...	10	...	1	...	...	...	10	3
Vaucluse	...	...	4	...	4	...	...	...	...	...	2	4
Waterloo	4	1	25	...	20	...	...	...	1	...	9	4
Waverley	14	1	140	...	59	1	2	...	...	...	30	15
Willoughby	5	2	104	...	79	12	1	...	2	1	15	16
Woollahra	...	...	102	...	24	...	1	1	...	...	24	7
Shire of Ku-ring-gai	5	...	52	...	33	...	...	...	...	...	19	10
Extra-Metropolitan Municipalities.												
Auburn	5	1	62	...	29	...	...	...	...	...	9	3
Bankstown	...	...	103	...	32	...	1	...	2	...	9	2
Cabramatta and Canley Vale	...	...	15	...	8	...	1	...	...	...	3	...
Dundas	1	...	25	...	38	...	...	...	...	...	1	1
Ermington and Rydalmere	...	...	...	...	1	...	...	...	...	...	1	8
Fairfield	3	...	28	...	6	...	...	...	...	...	5	1
Granville	8	...	66	1	34	1	...	...	...	...	4	4
Holroyd	3	1	26	...	34	1	...	...	...	...	9	8
Ingleburn	...	...	3	...	2	...	...	...	...	...	...	...
Lidcombe	3	...	47	...	26	...	...	...	...	...	85	59
Liverpool	1	...	11	...	7	...	1	...	1	...	8	3
Parramatta	7	1	41	...	21	3	1	...	...	1	13	18
Shires.												
Hornsby	4	...	44	...	22	...	...	...	...	...	11	28
Warringah	2	...	8	...	14	...	...	...	...	...	6	2
Harbour of Port Jackson	...	...	...	...	...	...	...	...	...	...	3	...
Totals	269	26	3,258	43	1,899	76	49	12	16	15	1,090	605

TABLE II.—Showing the number of Notified Cases of, and Deaths from, Cerebro-spinal Fever (Meningococcal Meningitis), Diphtheria or Membranous Croup, Infantile Paralysis (Acute Anterior Poliomyelitis), Scarlet Fever, Typhoid Fever (including Paratyphoid), and Pulmonary Tuberculosis, in the HUNTER RIVER COMBINED DISTRICT, for the year ended 31st December, 1926.

District.	Typhoid and Paratyphoid.		Scarlet Fever.		Diphtheria.		Infantile Paralysis.		Cerebro-spinal Meningitis.		Pulmonary Tuberculosis.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
MUNICIPALITIES.												
Adamstown	2	...	1	...	14	...	...	...	...	...	2	...
Carrington	3	...	5	...	5	...	...	...	...	...	...	...
Greta	...	...	...	...	...	...	...	...	...	...	1	1
Hamilton	1	...	30	...	28	...	...	...	...	...	7	4
Lambton	1	...	6	...	9	...	...	...	...	...	...	3
Maitland, East	13	...	4	...	14	...	1	...	...	...	2	2
Maitland, West	1	...	2	...	9	1	...	...	...	...	2	4
Merewether	4	...	10	...	18	...	2	...	...	...	3	1
Morpeth	1	...	...	...	...	...	...	...	...	...	...	...
Newcastle	5	3	22	...	21	9	1	...	...	...	5	8
New Lambton	3	...	12	...	14	...	...	...	...	...	1	...
Raymond Terrace	...	...	1	...	1	...	...	...	...	...	...	...
Singleton	1	...	5	...	12	...	...	...	...	...	...	1
Stockton	5	...	5	...	27	...	...	...	...	...	4	6
Wallsend	2	4	9	...	6	...	...	...	2	...	1	1
Waratah	1	...	29	...	40	1	...	...	...	...	3	2
Wickham	2	...	6	...	26	...	1	...	...	...	1	2
SHIRES.												
Bolwarra	1	...	3	...	2	...	1	...	...	...	...	2
Cessnock	13	1	85	...	84	1	1	2	1	...	11	15
Lake Macquarie	10	...	55	...	38	...	1	...	...	...	16	7
Port Stephens	1	...	1	...	...	...	...	...	...	...	...	1
Tarro	6	1	18	...	11	3	...	...	...	...	1	1
Harbour of Port Hunter	...	...	...	...	...	...	...	...	...	...	...	...
Total	76	9	309	...	379	15	8	2	3	...	60	61

TABLE III.—Showing the number of Notified Cases of, and Deaths from, Cerebro-spinal Fever (Meningococcal Meningitis), Diphtheria or Membranous Croup, Infantile Paralysis (Acute Anterior Poliomyelitis), Scarlet Fever, Typhoid Fever (including Paratyphoid), and Pulmonary Tuberculosis, in the REMAINDER OF STATE, for the year ended 31st December, 1926.

District.	Typhoid and Paratyphoid.		Scarlet Fever.		Diphtheria.		Infantile Paralysis.		Cerebro-spinal Meningitis.		*Pulmonary Tuberculosis.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
MUNICIPALITIES.												
Aberdeen	...	...	2	...	2	...	...	...	...	...	...	...
Albury	1	2	22	1	22	2	...	...	...	...	...	2
Armidale	...	...	7	...	3	1	...	...	...	...	...	2
Ballina	2	...	4	...	1	...	...	...	...	...	...	1
Balranald	2	1	...	...	2	...	...	...	...	...	...	...
Barraba	1	1	2	...	...	...	...	...	...	...	...	...
Bathurst	1	...	22	...	2	...	...	...	1	...	...	5
Bega	...	...	...	...	1	...	...	...	...	...	...	2
Berry	...	...	5	...	4	...	...	...	...	...	...	...
Bingara	1	1	...	...	2	1	...	...	...	...	...	...
Blackheath	...	...	5	...	...	...	...	...	...	...	1	...
Blayney	...	...	3	...	...	...	...	...	...	...	...	1
Bombala	1	...	5	...	2	...	...	1	...	...	...	...
Bourke	...	1	...	...	...	...	...	...	...	...	...	2
Bowral	1	1	7	...	2	1	...	...	...	...	...	...
Braidwood	...	...	1	...	1	...	...	...	...	...	...	1
Brewarrina	...	...	...	...	...	1	...	...	...	...	...	3
Broken Hill	93	5	82	1	60	1	...	...	3	...	...	27
Broughton Vale	...	...	1	...	...	...	...	...	...	...	...	...
Burrowa	1	...	1	...	2	1	...	...	...	...	...	1
Camden	...	...	4	...	5	2	...	...	...	...	...	1
Campbelltown	...	...	1	...	1	...	...	...	...	...	...	1
Carcoar	...	1	...	...	1	...	...	...	...	...	...	2
Casino	...	...	...	...	2	1	...	...	...	...	...	1
Castlereagh	...	...	...	...	...	...	...	...	...	...	...	...
Cobar	...	...	...	...	...	...	...	...	...	...	...	1
Condobolin	...	...	3	1	7	...	...	...	...	...	...	1
Cooma	2	...	1	...	...	...	...	...	...	...	...	...
Coonamble	1	...	...	...	27	1	...	...	...	...	...	...
Cootamundra	3	...	7	...	19	3	...	...	...	...	...	2
Coraki	...	...	...	...	2	1	...	...	...	...	...	...
Corowa	...	...	2	...	13	...	...	...	...	1	...	3
Cowra	...	...	2	1	8	...	...	...	...	...	...	2
Cudal	...	...	...	...	...	...	...	...	...	...	...	...
Cudgegong	...	...	...	...	...	...	...	...	...	...	...	...
Deniliquin	...	...	1	...	15	...	...	...	...	...	...	1
Dubbo	7	1	18	...	33	1	...	...	...	...	...	2

* Notifiable in Blackheath and Katoomba Municipalities.

REMAINDER OF STATE.—Return showing the number of Cases, &c., from Country Municipalities—*continued.*

District.	Typhoid and Paratyphoid.		Scarlet Fever.		Diphtheria.		Infantile Paralysis.		Cerebro-spinal Meningitis.		* Pulmonary Tuberculosis.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
	MUNICIPALITIES.—*continued.*											
Dungog	...	1	9	...	3	1	1	1	...	...	...	...
Forbes	8	1	12	...	1	1	...	...	...	...	...	...
Gerringong	...	...	3	...	...	...	...	...	...	...	...	...
Glen Innes	3	...	11	...	14	...	...	...	1	1	...	2
Goulburn	19	2	36	1	7	1	...	...	...	...	...	7
Grafton	3	...	33	...	4	1	...	...	...	...	...	4
Grafton, South	...	...	2	...	1	...	...	...	...	...	...	...
Grenfell	...	...	...	...	...	...	...	...	...	...	...	...
Gulgong	2	...	1	...	2	...	...	...	...	...	...	1
Gundagai	...	...	...	...	...	...	...	...	...	...	...	...
Gunnedah	...	...	9	...	10	...	...	...	...	...	...	2
Hay	...	...	7	...	4	...	...	...	...	...	...	1
Hillgrove	...	...	...	...	...	...	...	...	...	...	...	...
Hillston	1	2	...	...	...	...	...	...	...	...	...	1
Illawarra, Central	1	...	15	...	21	...	...	...	...	...	...	...
Illawarra, North	...	...	24	...	10	...	...	...	...	...	...	1
Inverell	1	1	...	...	15	1	...	...	...	1	...	1
Jamberoo	...	...	...	...	...	...	...	...	...	...	...	...
Junce	1	...	9	...	26	2	...	...	1	1	...	...
Katoomba	...	...	5	...	4	...	...	...	...	...	14	17
Kempsey	...	...	2	...	9	2	...	...	...	...	...	4
Kiama	1	...	3	...	8	1	...	...	...	...	...	...
Lismore	2	2	8	...	7	...	...	...	...	...	...	2
Lithgow	3	...	3	...	19	...	2	...	...	...	...	5
Maclean	...	...	...	...	5	...	...	1	...	...	...	...
Manilla	1	1	9	...	3	...	...	...	...	...	...	...
Mittagong	1	...	9	...	1	...	...	...	...	...	...	1
Moama	...	...	...	...	...	...	...	...	...	...	...	1
Molong	...	...	2	...	3	...	...	...	...	...	...	1
Moree	1	...	6	...	6	...	...	...	...	...	...	2
Moruya	...	...	...	...	...	...	...	...	...	...	...	...
Moss Vale	...	...	3	...	1	...	...	...	...	...	...	...
Mudgee	...	...	14	...	44	1	...	...	...	...	...	5
Mulgoa	...	...	...	...	...	...	...	...	...	...	...	...
Mullumbimby	...	...	1	...	...	...	...	...	...	...	...	...
Murrumburrah	...	...	5	1	2	...	2	...	...	...	...	1
Murrurundi	1	...	1	...	3	...	...	...	...	...	...	...
Murwillumbah	1	...	...	...	2	...	...	...	...	...	...	1
Muswellbrook	...	...	30	...	7	...	...	...	1	1	...	1
Narrabri	1	...	8	1	10	...	...	...	...	...	...	...
Narrabri, West	...	...	...	...	2	...	...	...	...	...	...	...
Narrandera	1	...	10	...	23	3	...	...	...	...	...	5
Narromine	...	...	1	...	2	...	...	...	...	...	...	1
Nowra	...	...	...	...	...	...	1	...	...	...	...	...
Nyngan	...	...	...	...	2	...	...	...	...	...	...	1
Orange	13	3	26	...	29	...	...	...	...	...	...	9
Orange, East	...	...	...	...	...	...	...	...	...	...	...	...
Parkes	16	3	14	...	6	2	...	...	...	...	...	1
Peak Hill	1	...	2	...	4	...	...	...	1	1	...	...
Penrith	1	...	...	...	4	1	...	...	...	...	...	2
Picton	...	...	5	...	...	...	...	...	...	...	...	...
Port Macquarie	1	...	1	...	...	...	...	...	...	...	...	1
Queanbeyan	...	...	2	...	1	...	...	...	...	...	...	1
Quirindi	1	...	2	...	2	2	...	...	...	...	...	1
Richmond	...	...	2	...	2	...	...	...	...	...	...	1
Scone	7	...	2	...	10	...	...	...	...	...	...	...
Shellharbour	...	...	1	...	2	...	...	...	...	...	...	1
Shoalhaven, South	...	...	...	...	...	...	...	...	...	...	...	...
St. Mary's	...	...	2	...	2	...	...	...	...	...	...	1
Tamworth	8	3	11	1	35	1	...	...	1	...	...	3
Taree	1	1	5	...	8	2	...	...	...	...	...	3
Temora	3	3	12	...	7	...	...	...	...	...	...	1
Tenterfield	...	...	1	...	3	...	...	...	...	...	...	2
Tumut	8	...	21	...	...	...	1	1	...	...	...	3
Ulladulla	...	...	1	...	9	...	...	...	...	...	...	1
Ulmarra	...	...	...	...	5	...	...	...	...	...	...	...
Uralla	...	...	1	...	...	...	...	...	...	...	...	...
Wagga	4	1	19	...	12	...	...	...	...	...	...	5
Walcha	...	...	7	...	...	...	...	...	...	...	...	...
Wallendbeen	...	...	...	...	...	...	...	...	...	...	...	...
Warialda	...	...	...	...	...	...	...	...	...	...	...	...
Warren	...	...	5	...	...	...	...	...	...	...	...	1
Wellington	1	...	8	...	12	...	...	...	...	...	...	4
Wentworth	...	...	...	...	...	...	...	1	...	...	...	...
Wilcannia	1	...	1	...	...	...	...	...	...	...	...	...
Windsor	...	...	3	...	4	...	...	...	...	...	...	2
Wingham	...	...	4	...	...	...	...	...	...	...	...	...
Wollongong	...	...	24	...	9	...	...	...	...	...	...	3
Wyalong	...	...	...	...	1	...	...	...	...	...	...	...
Yass	4	...	...	...	1	...	...	...	...	...	...	1
Young	2	2	7	...	1	...	...	...	...	...	...	2
Total, Municipalities	241	40	688	8	689	39	7	5	9	6	15	181

* Notifiable only in the Blackheath and Katoomba Municipalities.

REMAINDER OF STATE.—Return showing the number of Cases, &c., from Country Shires.

2. SHIRES.

Shires.	Typhoid and Paratyphoid.		Scarlet Fever.		Diphtheria.		Infantile Paralysis.		Cerebro-spinal Meningitis.		Pulmonary * Tuberculosis.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
Abercrombie	...	...	5	...	5	...	...	...	...	...	...	5
Amaroo	...	...	5	...	3	...	...	...	...	...	...	...
Apsley	...	...	3	...	...	...	...	...	...	...	...	...
Ashford	1	...	...	...	...	...	...	...	...	...	...	1
Bannockburn	...	...	...	...	7	...	...	...	1	...	...	1
Barraba	3	...	7	...	2	...	...	...	...	...	...	...
Baulkham Hills	1	...	10	...	3	...	...	...	...	...	...	...
Bellingen	...	...	6	...	19	...	...	...	...	...	...	2
Berrigan	1	...	...	...	3	2	...	...	...	...	...	3
Bibbenluke	...	...	2	...	...	...	1	...	...	...	...	...
Blacktown	1	...	20	...	16	1	...	...	1	...	...	2
Bland	1	...	12	...	6	...	...	...	...	...	...	3
Blaxland	2	...	11	...	8	...	...	...	...	...	...	4
Blue Mountains	...	...	18	...	9	...	...	...	...	...	100	22
Bogan	...	...	...	...	4	...	...	...	...	...	...	...
Booloroo	...	...	2	...	...	...	...	...	...	...	...	...
Boomi	...	...	...	...	...	...	...	...	...	...	...	...
Boree	1	...	15	...	2	2	...	...	...	1	...	2
Bulli	4	1	15	...	22	2	3	1	...	1	...	190
Burrangong	2	...	1	...	2	...	...	...	...	...	...	2
Byron	...	...	2	...	...	...	...	...	...	...	...	1
Cambewarra	...	...	...	...	...	...	...	...	...	...	...	...
Canoblas	7	...	6	...	8	...	...	...	...	...	...	1
Carrathool	2	...	5	...	14	...	...	...	...	...	...	...
Clyde	...	...	...	...	2	...	...	...	...	...	...	...
Cobborah	2	...	3	...	14	...	1	...	...	...	...	...
Cockburn	3	...	4	...	10	...	...	...	...	...	...	...
Colo	...	...	1	...	...	...	...	...	...	...	...	1
Conargo	...	...	...	...	...	...	...	...	...	...	...	...
Coolah	...	...	4	...	...	...	...	...	...	...	...	...
Coolamon	7	...	3	...	20	...	...	...	...	...	...	1
Coonabarabran	3	...	8	...	...	...	...	...	...	...	...	1
Copmanhurst	...	...	5	...	2	...	...	...	...	...	...	1
Coreen	...	...	...	...	12	...	...	...	1	...	...	...
Crookwell	1	1	3	1	5	...	...	...	...	...	...	2
Cudgegong	...	...	9	...	10	...	...	...	...	...	...	...
Culcairn	1	...	5	...	18	...	...	...	...	...	...	1
Dalgety	...	...	3	...	...	...	...	...	...	...	...	...
Demondrille	...	...	1	...	...	...	1	...	...	...	...	...
Dorrigo	...	...	...	...	7	2	...	...	...	...	...	1
Dumaresq	...	...	1	...	3	...	...	...	...	...	...	...
Erina	2	...	16	...	14	1	2	...	...	...	...	1
Eurobodalla	...	...	3	...	17	...	...	...	...	...	...	...
Gadara	1	...	8	...	4	...	...	...	...	...	...	3
Gilgandra	1	...	16	...	10	1	...	...	...	...	...	...
Gloucester	...	...	...	...	3	...	...	...	...	...	...	1
Goobang	2	...	1	...	3	...	...	...	...	...	...	...
Goodradigbee	1	...	1	...	...	...	...	...	...	...	...	...
Gostwyck	...	...	8	...	...	...	...	...	...	...	...	...
Gundagai	...	...	...	...	1	...	...	...	...	...	...	...
Gundurimba	...	...	1	...	1	...	...	...	...	...	...	...
Gunning	...	...	1	...	2	...	...	...	...	...	...	...
Guyra	...	...	2	...	1	...	...	...	...	...	...	2
Gwydir	...	...	...	...	1	...	...	...	...	...	...	...
Harwood	...	...	4	...	5	...	1	...	...	...	...	1
Hastings	1	...	1	...	3	...	...	...	...	...	...	1
Holbrook	1	...	3	...	15	...	...	...	...	...	...	...
Hume	6	...	12	...	8	...	...	...	...	...	...	...
Illabo	3	...	...	...	29	...	...	...	...	...	...	...
Imlay	1	...	4	...	8	...	...	...	...	...	...	...
Jemalong	3	...	5	...	2	...	...	...	...	...	...	...
Jerilderie	...	...	3	...	...	...	...	...	...	...	...	...
Jindalee	1	...	2	...	...	...	...	...	...	...	...	...
Kyeamba	1	...	11	...	3	...	...	...	...	...	...	...
Kyogle	4	...	2	...	16	2	...	...	...	...	...	...
Lachlan	...	...	...	...	1	...	...	...	...	...	...	2
Liverpool Plains	...	...	8	...	9	...	...	...	...	...	...	1
Lockhart	2	...	...	...	1	...	...	...	...	...	...	1
Lyndhurst	...	...	1	...	8	...	...	...	...	...	...	...
McIntyre	...	...	1	...	...	...	...	...	...	...	...	...
Macleay	...	...	1	...	7	...	...	...	...	...	...	...
Macquarie	...	...	...	...	4	...	...	...	...	...	...	1
Mandowa	...	...	4	...	...	...	...	...	...	...	...	...
Manning	2	1	11	...	9	...	...	...	...	...	...	2
Marthaguy	1	...	3	...	...	...	...	...	...	...	...	...
Merriwa	...	...	9	...	1	...	...	...	...	...	...	...
Mitchell	...	...	4	...	...	...	...	...	...	...	...	...
Monaro	...	...	9	...	...	...	...	...	...	...	...	...
Mulwarree	1	...	5	...	2	...	...	...	...	...	...	4

* Notifiabl only in the Blue Mountain Shire.

REMAINDER OF STATE.—Return showing the number of Cases, &c., from Country Shires—*continued.*

Shire.	Typhoid and Paratyphoid.		Scarlet Fever.		Diphtheria.		Infantile Paralysis.		Cerebro-spinal Meningitis.		Pulmonary* Tuberculosis.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
SHIRES—*continued.*												
Mumbulla	...	...	...	...	3	...	1	...	...	...	...	...
Murray	...	...	...	...	1	...	...	...	...	...	...	1
Murrumbidgee	...	...	1	...	...	1	...	...	...	...	...	2
Murrungal	...	...	4	...	3	...	...	...	...	...	...	...
Muswellbrook	...	...	1	...	3	...	...	1	...	...	...	...
Nambucca	...	...	3	...	16	...	...	...	...	...	...	1
Namoi	2	...	5	...	10	...	1	...	...	...	...	...
Narraburra	1	...	8	...	4	...	...	...	...	...	...	...
Nattai	2	...	1	...	1	...	...	...	...	...	...	...
Nepean	2	...	...	...	6	...	...	...	...	...	...	...
Nundle	1	...	1	...	2	...	...	...	...	...	...	...
Nymboida	...	...	2	...	2	...	...	...	...	...	...	...
Oberon	...	...	...	...	...	...	...	...	...	...	...	...
Orara	...	...	2	...	...	...	...	...	...	...	...	...
Patrick's Plains	2	1	1	...	13	...	...	...	...	...	...	2
Peel	...	...	4	...	7	...	...	...	...	...	...	1
Rylstone	...	...	24	...	4	1	...	...	...	...	...	1
Severn	...	...	...	...	7	...	...	...	...	...	...	1
Stroud	...	...	1	...	1	...	1	...	...	...	...	...
Sutherland	...	...	24	...	5	...	...	...	...	...	...	3
Talbragar	...	...	5	...	12	...	...	...	...	...	...	1
Tallaganda	...	...	...	...	...	...	...	...	...	...	...	...
Tamarang	...	...	...	...	8	...	...	...	...	...	...	1
Tenterfield	...	...	3	...	6	...	...	...	...	...	...	...
Terania	...	...	1	...	1	...	...	...	...	...	...	...
Timbrebongie	1	...	2	...	1	...	...	...	1	...	...	...
Tintenbar	...	...	5	...	3	...	...	...	...	...	...	1
Tomki	...	...	...	...	...	...	...	...	...	...	...	...
Tumbarumba	...	...	12	1	...	...	...	...	...	...	...	...
Turon	...	...	5	...	...	...	...	...	...	...	...	1
Tweed	...	...	...	...	4	...	...	...	...	...	...	...
Upper Hunter	2	...	1	...	...	...	...	...	...	...	...	...
Urana	3	...	1	...	1	...	...	...	...	...	...	...
Wakool	1	...	...	...	...	...	...	...	...	...	...	3
Walgett	...	...	...	...	...	...	...	...	...	...	...	1
Wallarobba	5	...	2	...	8	1	1	...	...	...	...	...
Waradgery	1	...	...	...	...	...	...	...	...	...	...	...
Warrah	...	...	1	...	3	...	...	...	...	...	...	2
Waugoola	2	...	2	...	3	...	...	...	...	...	...	...
Weddin	...	...	...	...	...	...	...	...	...	...	...	...
Windouran	...	...	1	...	...	...	...	...	...	...	...	...
Wingadee	...	...	...	...	6	...	...	...	...	...	...	1
Wingecarribee	...	...	...	...	2	...	...	...	...	...	...	...
Wollondilly	1	...	1	...	3	...	1	...	...	...	...	...
Woodburn	...	...	...	...	2	...	...	...	...	...	...	1
Wyaldra	1	...	...	...	...	...	...	...	...	...	...	1
Yallaroi	...	...	2	...	3	...	2	...	...	...	...	...
Yanko	...	...	13	...	30	...	1	...	...	...	...	...
Yarrowlumla	1	...	6	...	...	...	...	...	...	...	...	1
Total	105	4	500	2	608	16	17	2	4	2	100	293
COUNTRY POLICE DISTRICTS.												
Balranald	1	...	...	...	...	...	...	...	...	...	...	...
Bourke	...	...	...	...	...	...	...	...	...	...	...	...
Brewarrina	1	...	...	...	1	...	...	...	...	...	...	...
Broken Hill	...	...	...	...	...	...	...	...	...	...	...	...
Cobar	...	...	...	...	...	...	...	...	...	...	...	...
Hay	...	...	...	...	...	...	...	...	...	...	...	...
Hillston	...	...	...	...	...	...	...	...	...	...	...	...
Menindie	...	...	...	...	...	...	...	...	...	...	...	...
Mitchell	5	...	...	...	3	...	...	...	...	...	...	...
Walgett	...	...	...	...	...	...	...	...	...	...	...	...
Wentworth	...	...	...	...	...	...	...	...	...	...	...	...
Wilcannia	...	...	...	...	...	...	...	...	...	...	...	...
Western Division (unincorporated)	...	1	...	...	...	1	...	...	...	...	...	4
Total	7	1	...	...	4	1	...	...	...	...	...	4
Outside the State—												
Queensland	...	...	...	...	...	...	...	...	...	...	...	...
Victoria	8	...	...	...	4	...	...	...	...	...	...	...
South Australia	...	...	...	...	...	...	...	...	...	...	...	...
Total	8	...	...	...	4	...	...	...	...	...	...	...

* Notifiable only in the Blue Mountain Shire.

TABLE IV.—Table showing Age and Sex Incidence, and Mortality, in the Metropolitan Combined District, Hunter River Combined District, and Remainder of State, from the notified cases of Cerebro-spinal Fever (Meningococcal Meningitis), Diphtheria and Membranous Croup, Infantile Paralysis (Acute Anterior Poliomyelitis), Scarlet Fever, Typhoid Fever (including Paratyphoid), and Pulmonary Tuberculosis, for the year ended 31st December, 1926.

Age Period.	Typhoid and Paratyphoid.						Scarlet Fever.						Diphtheria.						Infantile Paralysis.						Cerebro-spinal Meningitis.						*Pulmonary Tuberculosis.					
	Incidence.			Mortality.			Incidence.			Mortality.			Incidence.			Mortality.			Incidence.			Mortality.			Incidence.			Mortality.			Incidence.			Mortality.		
	Notified cases.			Notified deaths.			Notified cases.			Notified deaths.			Notified cases.			Notified deaths.			Notified cases.			Notified deaths.			Notified cases.			Notified deaths.			Notified cases.			Notified deaths.		
	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total.
METROPOLITAN COMBINED DISTRICT.																																				
All ages	130	139	269	12	14	26	1,155	2,103	3,258	22	21	43	928	971	1,899	42	34	76	22	27	49	6	6	12	11	5	16	10	5	15	681	409	1,090	371	234	605
Under 1 year	...	...	...	...	...	...	9	10	19	1	1	2	29	13	42	9	3	12	3	3	6	2	2	4	5	2	7	4	2	6	...	...	...	...	2	2
1—4	2	5	7	...	...	...	281	292	573	12	8	20	399	354	753	25	21	46	11	18	29	3	2	5	5	1	6	5	1	6	1	1	2	1	2	3
5—14	45	44	89	...	3	3	652	1,232	1,884	6	6	12	412	411	823	8	10	18	5	6	11	...	2	2	...	1	1	...	...	...	3	10	13	2	1	3
15—24	33	36	69	3	2	5	116	300	416	...	3	3	45	81	126	...	...	...	1	...	1	...	...	...	...	1	1	...	...	...	81	117	198	21	48	69
25—34	15	26	41	1	4	5	58	190	248	...	3	3	25	64	89	...	...	...	2	...	2	...	...	...	1	...	1	...	...	...	143	133	276	85	60	145
35—44	19	17	36	4	2	6	25	45	70	2	...	2	8	35	43	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	143	86	229	96	56	152
45—54	10	4	14	2	1	3	7	22	29	1	...	1	4	3	7	...	...	...	...	...	...	1	...	1	...	...	...	...	2	2	107	36	143	63	27	90
55—64	3	4	7	...	2	2	3	2	5	...	...	...	3	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	66	12	78	60	19	79
65 and over	2	3	5	2	...	2	...	...	...	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	42	10	52	42	19	61
Age not stated	1	...	1	...	...	...	4	10	14	...	...	...	3	7	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	95	4	99	1	...	1
HUNTER RIVER COMBINED DISTRICT.																																				
All ages	49	27	76	3	6	9	86	223	309	...	...	...	192	187	379	12	3	15	5	3	8	...	2	2	2	1	3	...	...	...	37	23	60	32	29	61
Under 1 year	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1—4	3	2	5	...	...	...	26	35	61	...	...	...	99	92	191	8	1	9	3	2	5	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...
5—14	15	5	20	...	...	...	41	138	179	...	...	...	72	67	139	1	1	2	2	1	3	...	2	2	1	...	1	...	...	...	...	1	1	...	...	...
15—24	14	13	27	3	6	9	10	28	38	...	...	...	8	9	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	9	14	3	3	6
25—34	4	3	7	...	...	...	4	14	18	...	...	...	3	11	14	...	1	1	...	...	...	...	...	...	...	1	1	...	...	...	6	5	11	3	7	10
35—44	10	1	11	...	...	...	3	3	6	...	...	...	6	4	10	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	9	3	12	8	8	16
45—54	2	3	5	...	...	...	1	1	2	...	...	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	4	17	11	7	18
55—64	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	6	...	6
65 and over	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	4	5
Age not stated	...	...	...	...	...	...	1	4	5	...	...	...	3	3	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	...	...	...
REMAINDER OF STATE.																																				
All ages	235	118	353	28	17	45	412	776	1,188	6	4	10	560	741	1,301	33	23	56	12	12	24	4	3	7	9	4	13	5	3	8	75	40	115	288	190	478
Under 1 year	...	...	...	...	...	...	3	4	7	1	...	1	19	11	30	6	4	10	2	...	2	...	...	...	1	1	2	...	1	1	...	...	...	...	...	...
1—4	14	7	21	...	...	...	105	105	210	2	1	3	215	207	422	23	15	38	6	7	13	2	3	5	2	...	2	1	...	1	...	...	...	1	...	1
5—14	63	39	102	2	2	4	248	450	698	3	...	3	216	291	507	3	4	7	1	3	4	1	...	1	3	...	3	1	...	1	...	...	...	1	4	5
15—24	69	33	102	8	3	11	26	117	143	...	1	1	50	104	154	1	...	1	3	2	5	1	...	1	1	...	1	1	1	2	4	5	9	27	54	81
25—34	41	22	63	8	6	14	14	58	72	...	2	2	39	80	119	...	...	...	...	...	...	...	...	...	1	...	1	2	...	2	21	17	38	45	49	94
35—44	21	10	31	4	4	8	9	20	29	...	...	...	12	24	36	...	...	...	...	...	...	...	...	...	1	1	2	...	1	1	10	11	21	63	39	102
45—54	22	5	27	5	2	7	4	5	9	...	...	...	2	11	13	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	13	5	18	69	17	86
55—64	3	2	5	1	...	1	1	3	4	...	...	...	2	1	3	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2	2	4	51	14	65
65 and over	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	31	13	44
Age not stated	2	...	2	...	...	...	2	14	16	...	...	...	5	11	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24	...	24	...	...	...

SUMMARY.

District.	Typhoid Fever.		Scarlet Fever.		Diphtheria.		Infantile Paralysis.		Cerebro-spinal Meningitis.		*Pulmonary Tuberculosis	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
Metropolitan Combined Sanitary District	269	26	3,258	43	1,899	76	49	12	16	15	1,090	605
Hunter River Combined Sanitary District	76	9	309	...	379	15	8	2	3	...	60	61
Remainder of State—												
Municipalities	241	40	688	8	689	39	7	5	9	6	15	181
Shires	105	4	500	2	608	16	17	2	4	2	100	293
Police Districts	7	1	...	...	4	1	...	...	...	...	...	4
Total	698	80	4,755	53	3,579	147	81	21	32	23	1,265	1,144

* Notifiable only in Blackheath and Katoomba Municipalities and Blue Mountain Shire.

Table V.—Showing the seasonal prevalence of Cerebro-spinal Fever (Meningococcal Meningitis), Diphtheria and Membranous Croup, Infantile Paralysis (Acute Anterior Poliomyelitis), Scarlet Fever, Typhoid Fever (including Paratyphoid), and Pulmonary Tuberculosis, in New South Wales for the year ended 31st December, 1926.

Month, 1926.	Typhoid Fever and Paratyphoid.								Scarlet Fever.								Diphtheria.							
	Metropolitan Combined Districts.		Hunter River Combined Districts.		Remainder of State.		Total.		Metropolitan Combined Districts.		Hunter River Combined Districts.		Remainder of State.		Total.		Metropolitan Combined Districts.		Hunter River Combined Districts.		Remainder of State.		Total.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
January	43	7	5	1	30	6	78	14	182	1	22	...	74	1	278	2	129	6	29	...	84	4	242	10
February	15	...	9	...	76	5	100	5	176	2	19	...	72	1	267	3	136	5	21	...	73	6	230	11
March	23	4	11	3	58	9	92	16	258	5	31	...	75	...	364	5	169	2	30	2	109	5	308	9
April	18	3	8	...	36	3	62	6	239	1	13	...	83	1	335	2	216	4	41	...	75	3	332	7
May	9	1	7	1	38	3	54	5	317	2	24	...	102	1	443	3	214	12	45	2	118	4	377	18
June	6	...	4	...	16	1	26	1	286	3	29	...	99	...	414	3	213	7	44	3	129	3	386	13
July	7	...	1	1	6	2	14	3	239	1	35	...	78	...	352	1	155	6	48	3	107	2	310	11
August	14	1	...	...	11	1	25	2	235	4	34	...	73	2	342	6	142	5	30	2	81	5	253	12
September	8	2	4	1	7	...	19	3	242	9	18	...	92	1	352	10	152	15	25	1	132	2	309	18
October	8	3	9	1	9	1	26	5	371	5	24	...	90	...	485	5	120	6	18	...	76	9	214	15
November	15	3	2	...	26	5	43	8	268	5	25	...	164	1	457	6	90	5	14	1	140	5	244	11
December	103	2	16	1	40	9	159	12	445	5	35	...	186	2	666	7	163	3	34	1	177	8	374	12
Totals	269	26	76	9	353	45	698	80	3,258	43	309	...	1,188	10	4,755	53	1,899	76	379	15	1,301	56	3,579	147

Month, 1926.	Infantile Paralysis.								Cerebro-spinal Meningitis.								Pulmonary Tuberculosis.							
	Metropolitan Combined Districts.		Hunter River Combined Districts.		Remainder of State.		Total.		Metropolitan Combined Districts.		Hunter River Combined Districts.		Remainder of State.		Total.		Metropolitan Combined Districts.		Hunter River Combined Districts.		Remainder of State.		Total.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
January	25	1	2	...	7	1	34	2	2	...	1	...	...	...	3	...	95	48	4	4	9	32	108	84
February	8	...	4	1	2	1	14	2	1	...	...	...	1	1	2	1	79	31	8	3	14	47	101	81
March	4	4	...	...	3	2	7	6	1	...	...	...	...	...	1	...	75	50	5	6	6	46	86	102
April	5	1	2	...	4	1	11	2	...	...	...	...	...	...	...	...	56	40	2	4	12	46	70	90
May	...	...	...	1	1	...	1	1	...	...	...	...	...	...	...	...	199	65	7	8	15	33	221	106
June	1	...	...	...	1	1	2	1	1	2	...	...	3	1	4	3	72	67	6	4	7	47	85	118
July	1	...	...	...	1	...	2	...	3	1	...	...	...	1	3	2	89	69	1	10	3	48	93	127
August	...	1	...	...	1	1	1	2	1	2	...	...	3	1	4	3	83	53	4	7	11	33	98	93
September	...	1	...	...	...	...	...	1	3	5	...	...	1	2	4	7	76	36	5	4	5	40	86	80
October	1	2	...	...	...	...	1	2	1	1	...	...	2	1	3	2	101	37	9	2	15	43	125	82
November	...	1	...	...	3	...	3	1	2	2	2	...	2	...	6	2	88	70	5	4	14	32	107	106
December	4	1	...	...	1	...	5	1	1	2	...	...	1	1	2	3	77	39	4	5	4	31	85	75
Totals	49	12	8	2	24	7	81	21	16	15	3	...	13	8	32	23	1,090	605	60	61	115	478	1,265	1,144

Table VI.—Showing the number of Cases of Infectious Diseases notified in the State of New South Wales during the years 1898 to 1926, inclusive, and the number of deaths therefrom.

Year.	Population.	Typhoid Fever.		Scarlet Fever.		Diphtheria.		Plague.*		Infantile Paralysis.†		Cerebro-spinal Meningitis.‡		Pulmonary Tuberculosis.§		Total Deaths from Phthisis in N.S.W.§
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
1898	1,323,130	3,302	387	6,342	83	1,493	169	...	...	...	...	...	...	...	...	1,104
1899	1,344,080	2,783	347	1,389	25	741	60	...	...	...	...	...	...	...	...	1,078
1900	1,364,590	3,442	398	895	9	726	63	303	103	...	...	...	...	...	...	1,056
1901	1,376,199	2,702	291	1,288	16	922	131	...	...	...	...	...	...	...	...	1,134
1902	1,397,858	2,624	276	2,010	61	757	74	140	41	...	...	...	...	...	...	1,123
1903	1,416,879	4,855	475	5,358	87	1,214	134	2	...	...	...	...	...	...	...	1,235
1904	1,440,919	2,370	249	4,056	50	1,584	156	12	6	...	...	...	...	146	...	1,156
1905	1,469,153	2,226	239	1,773	21	1,118	102	56	21	...	...	...	...	128	...	1,037
1906	1,498,609	2,373	271	3,085	42	1,219	100	20	8	...	...	...	...	118	...	1,007
1907	1,531,980	1,972	189	2,570	26	1,376	133	51	20	...	...	...	...	161	...	961
1908	1,560,026	2,607	307	2,755	40	2,001	123	6	3	...	...	...	...	112	...	1,008
1909	1,596,685	2,615	287	7,178	30	2,419	166	24	7	...	...	...	...	196	...	1,040
1910	1,638,220	2,714	294	1,642	23	4,989	207	...	...	...	...	...	...	184	...	1,024
1911	1,698,735	1,864	184	2,618	11	4,784	226	...	...	...	...	...	...	222	...	1,099
1912	1,778,962	2,126	236	662	11	5,440	253	...	...	...	...	...	...	265	...	1,078
1913	1,832,546	2,187	236	1,120	23	6,380	310	...	...	47	10	...	...	228	...	1,210
1914	1,862,028	2,284	250	3,207	21	5,831	247	...	...	79	14	...	...	293	...	1,178
1915	1,868,644	1,941	219	8,335	97	5,838	264	...	...	63	11	50	33	361	86	1,122
1916	1,846,736	1,742	209	5,759	107	6,588	309	...	...	311	21	309	145	1,499	666	1,157
1917	1,886,701	1,091	103	2,255	27	5,805	247	...	...	16	12	197	98	1,319	584	1,017
1918	1,928,174	810	112	1,308	15	5,151	221	...	...	50	12	120	80	1,308	586	1,093
1919	2,000,173	857	106	959	10	2,826	114	...	...	8	3	28	23	1,102	678	1,216
1920	2,099,763	1,016	132	937	24	5,043	263	...	...	45	10	34	27	1,509	674	1,118
1921	2,128,786	949	129	1,060	8	6,854	306	2	1	184	22	30	28	1,240	791	1,129
1922	2,174,688	706	99	1,153	11	4,094	207	33	9	33	5	21	22	1,045	517	1,080
1923	2,211,106	873	104	2,623	13	3,480	176	1	1	104	8	27	22	1,218	657	1,109
1924	2,256,649	768	97	3,421	29	4,364	222	...	...	108	6	29	38	1,096	730	1,165
1925	2,300,081	533	80	3,043	27	3,004	118	...	...	57	14	37	27	1,195	617	1,022
1926	2,349,401	698	80	4,755	53	3,579	147	...	...	81	21	32	23	1,265	705	1,144

* Notifiable from 23rd January, 1900.
† " 1st February, 1912.
‡ " 11th October, 1915.
§ " 18th October, 1904, in the city of Sydney only; and under Public Health (Amendment) Act, 1915, from 11th August, 1915, in the Metropolitan and Hunter River Districts; from 2nd October, 1916, in the Katoomba Municipality and Blue Mountain Shire, and from 17th December, 1920, in the Blackheath Municipality. At time of writing it is not notifiable elsewhere in the State.

GRAPHS.

Annual Death-rate per 100,000 and case rate per 10,000 of population—

Typhoid Fever ... ... }
Scarlet Fever ... ... } 1898-1926
Diphtheria... ... ... }

Annual Death-rate per 100,000 of population—

Cancer and Tuberculosis... ... ... }
Diarrhœa and Enteritis (under 2 years) ... ... }
" " (2 years and over) ... ... } 1875-1926.
Measles ... ... }
Whooping Cough ... ... }

Annual Death-rate of Children under 1 year per 1,000 births ... 1875-1926.

Annual Death-rate of Women per 1,000 births—

Childbirth and Puerperal Septicæmia ... ... 1875-1926.

Annual Death-rate per 1,000 of population in New South Wales... 1875-1926.

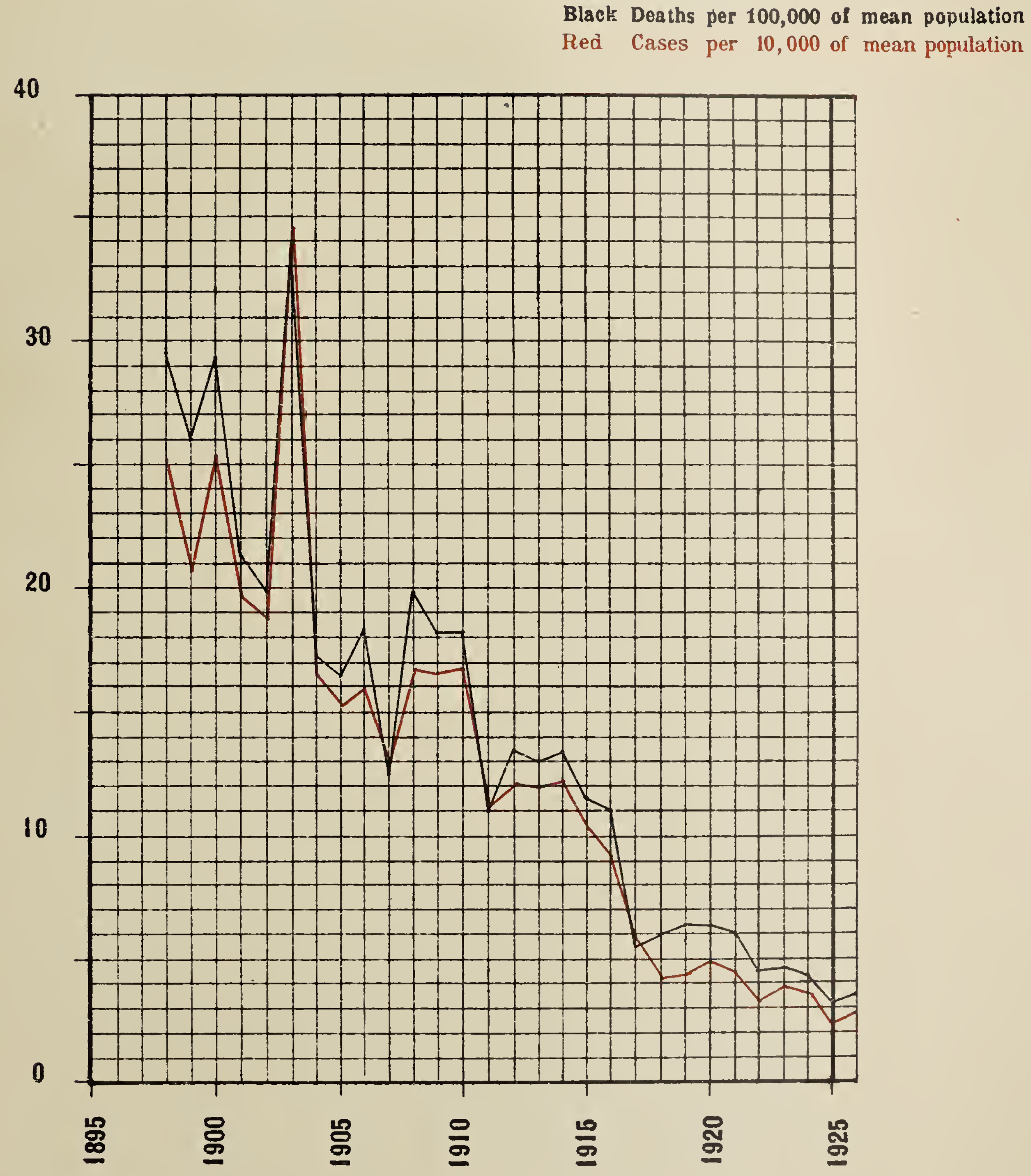
TYPHOID FEVER.

ANNUAL DEATH RATE PER 100,000 AND CASE RATE PER 10,000 OF POPULATION

IN

NEW SOUTH WALES,

1898–1926.



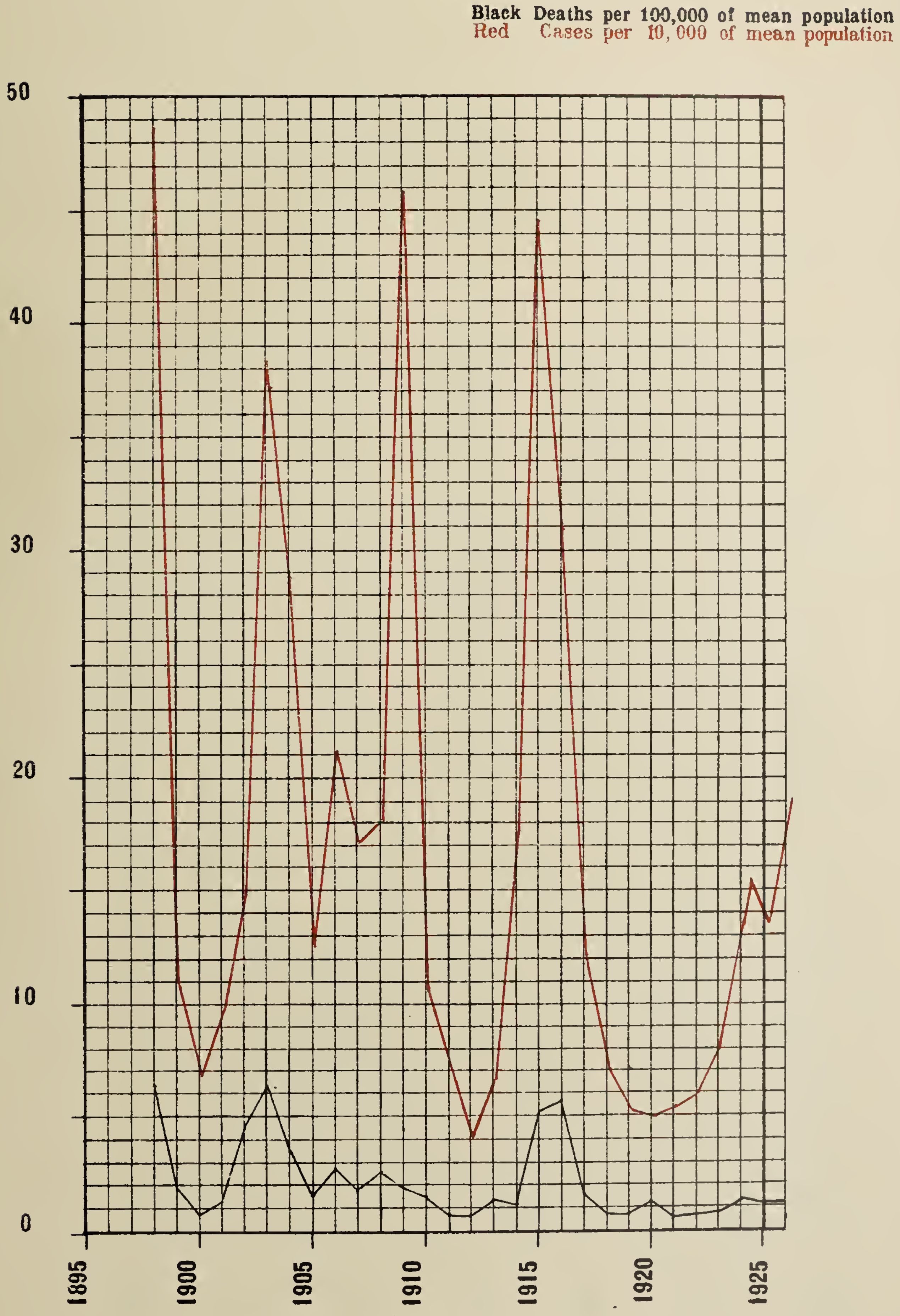
SCARLET FEVER.

ANNUAL DEATH RATE PER 100,000 AND CASE RATE PER 10,000 OF POPULATION

IN

NEW SOUTH WALES,

1898–1926.



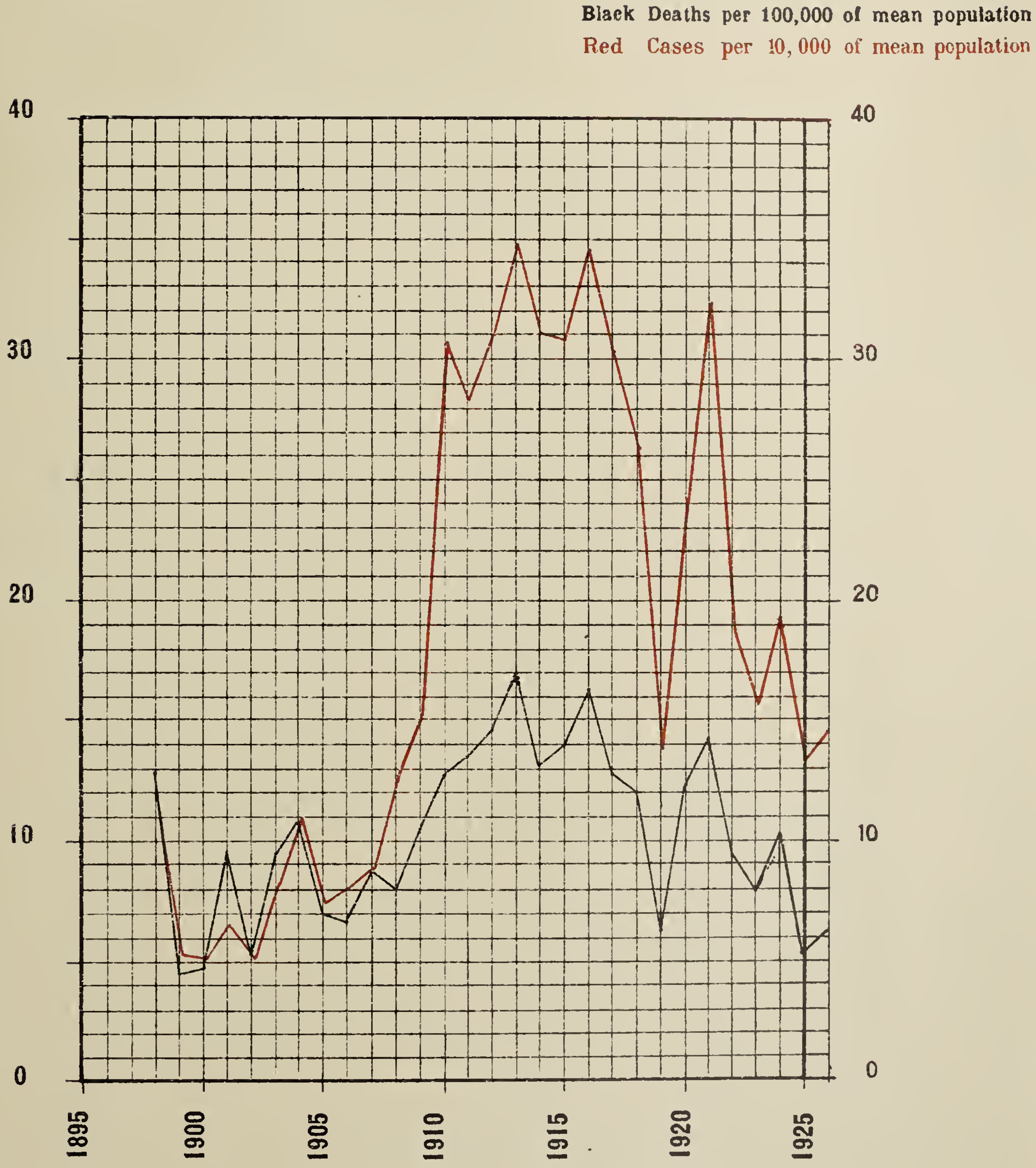
DIPHTHERIA

ANNUAL DEATH RATE PER 100,000 AND CASE RATE PER 10,000 OF POPULATION

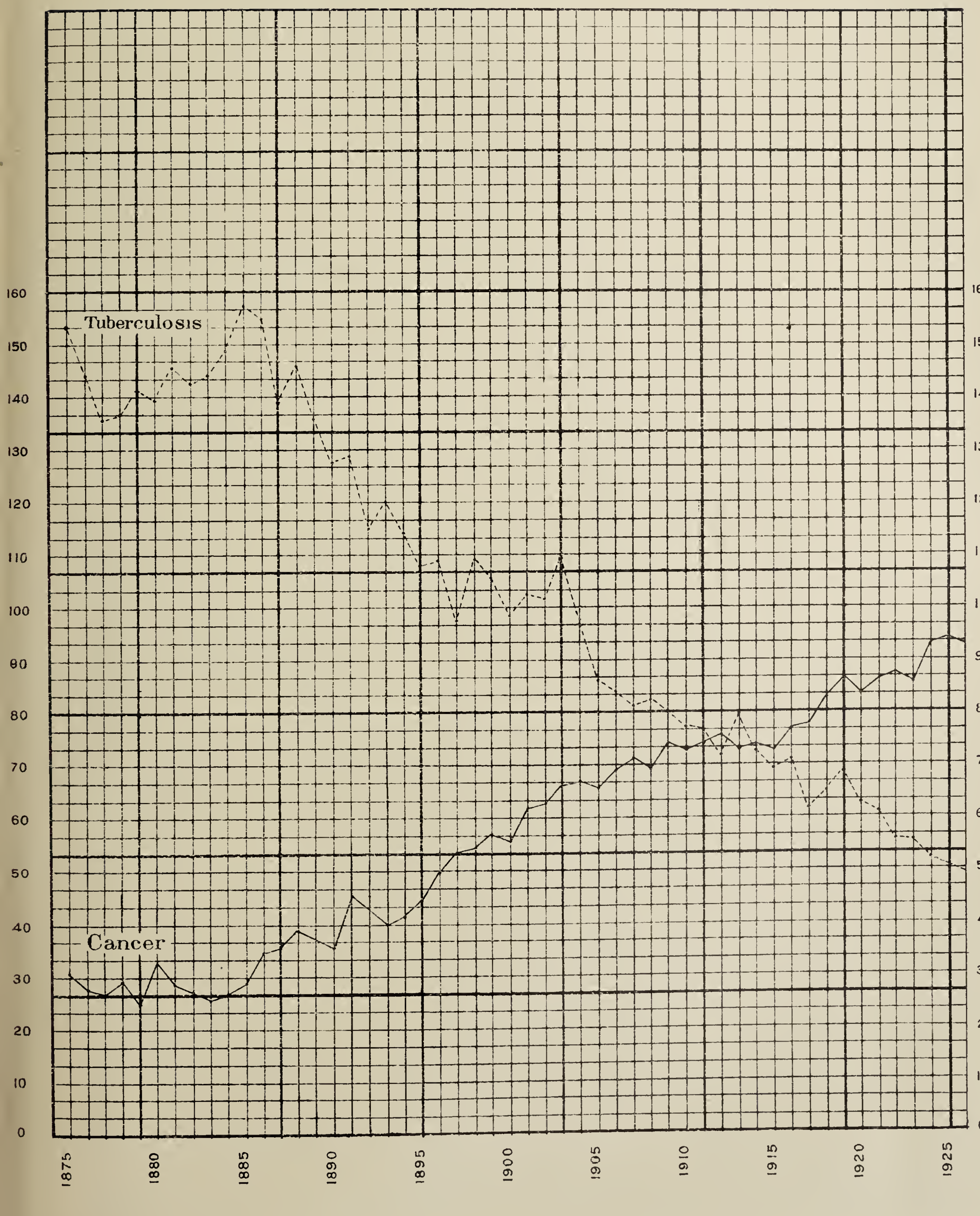
IN

NEW SOUTH WALES,

1898-1926.

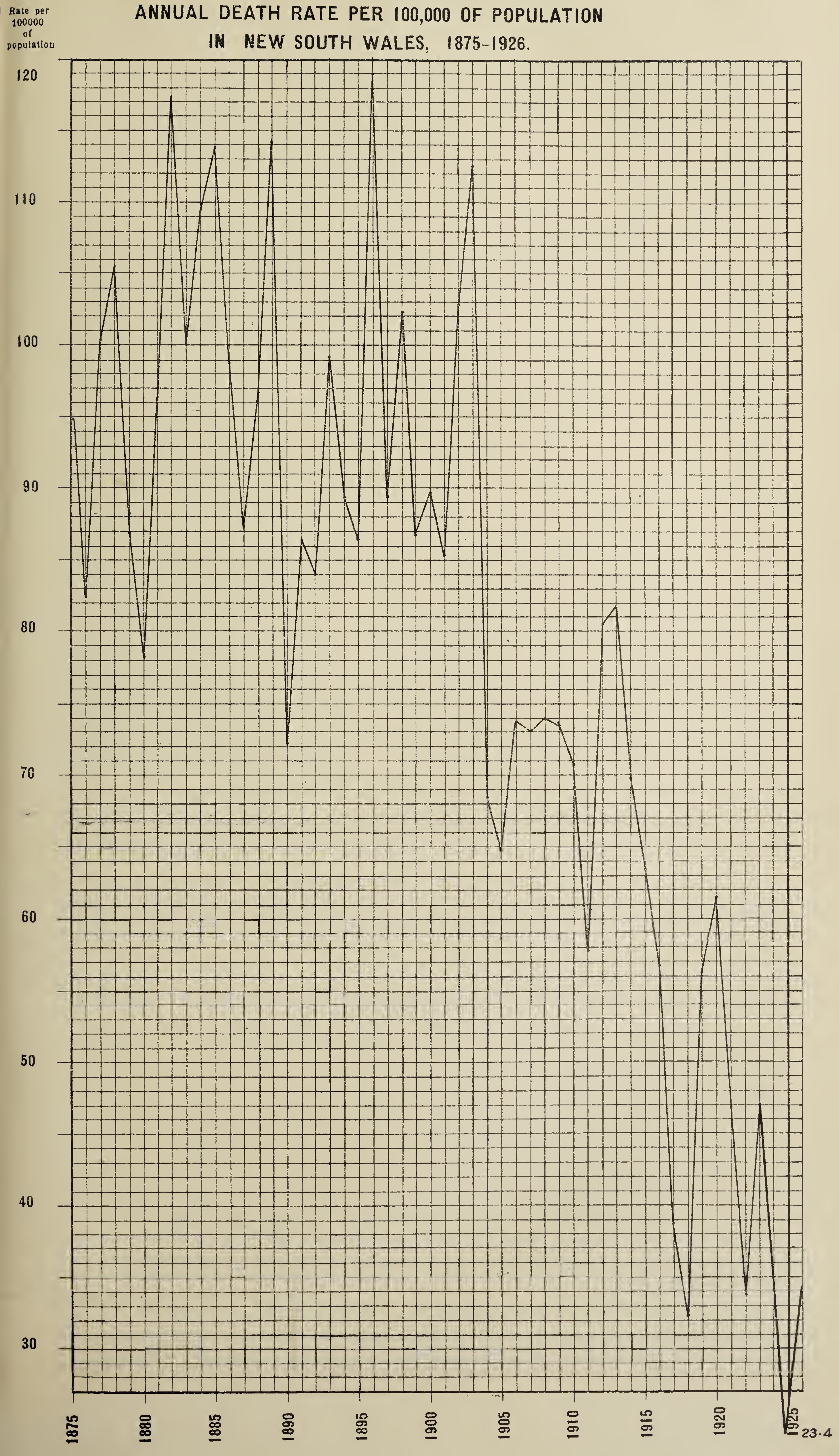


CANCER AND TUBERCULOSIS.
ANNUAL DEATH RATE PER 100,000 OF POPULATION
IN
NEW SOUTH WALES
1875 - 1926.

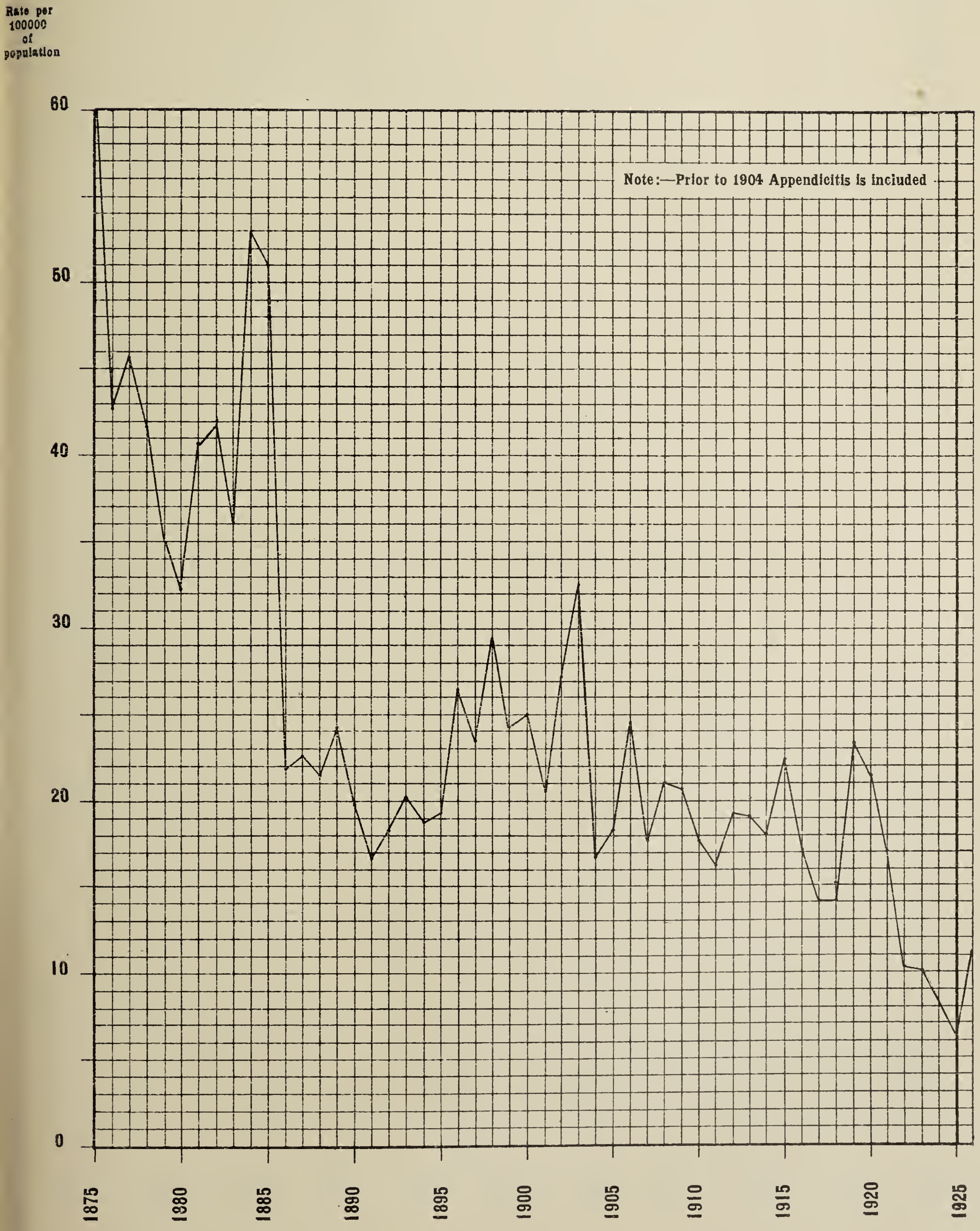


DIARRHŒA AND ENTERITIS (Under 2 years).

ANNUAL DEATH RATE PER 100,000 OF POPULATION IN NEW SOUTH WALES, 1875–1926.



DIARRHŒA AND ENTERITIS (2 years and over).
ANNUAL DEATH RATE PER 100,000 OF POPULATION
IN
NEW SOUTH WALES,
1875-1926.



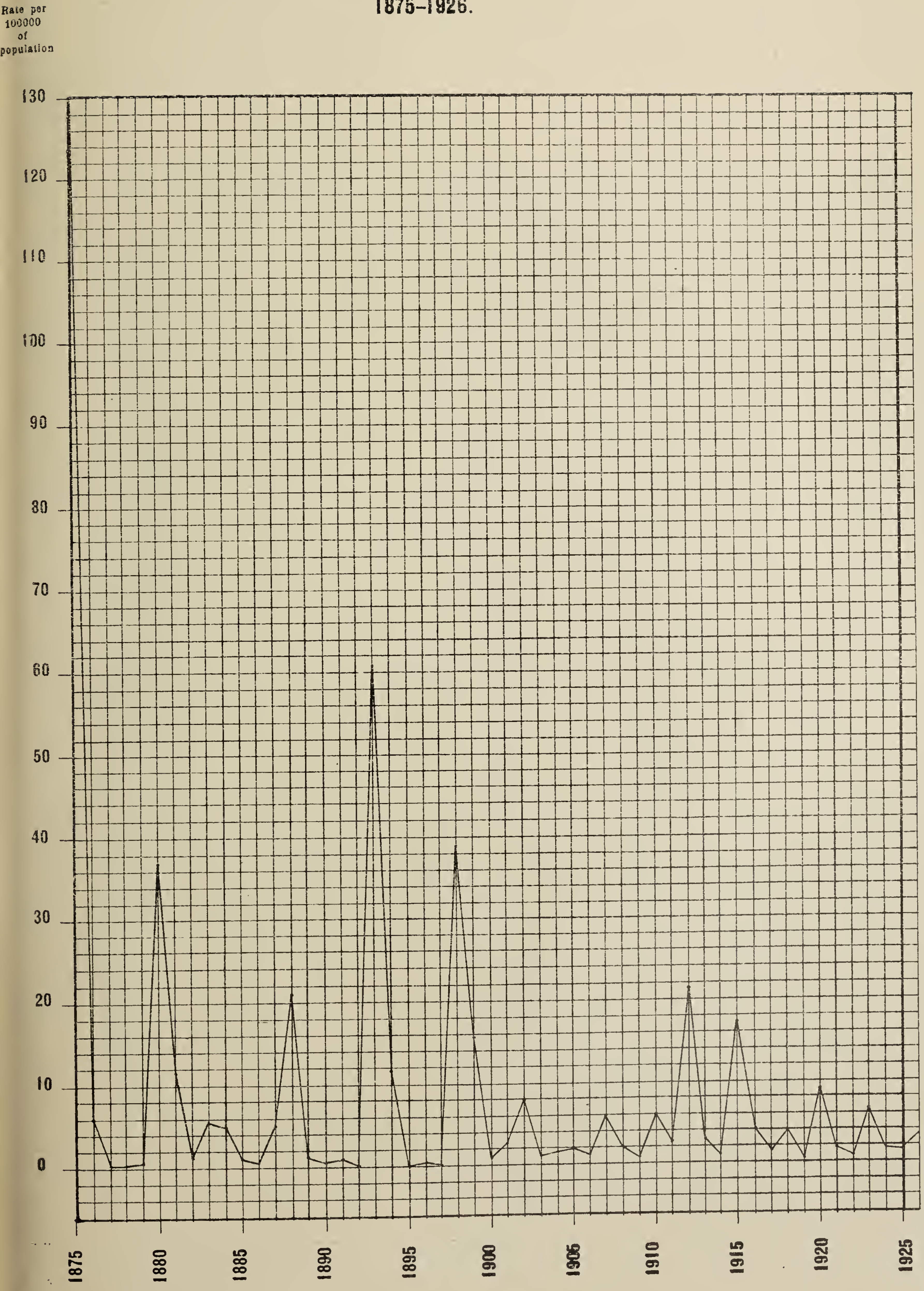
MEASLES.

ANNUAL DEATH RATE PER 100,000 OF POPULATION

IN

NEW SOUTH WALES,

1875-1926.



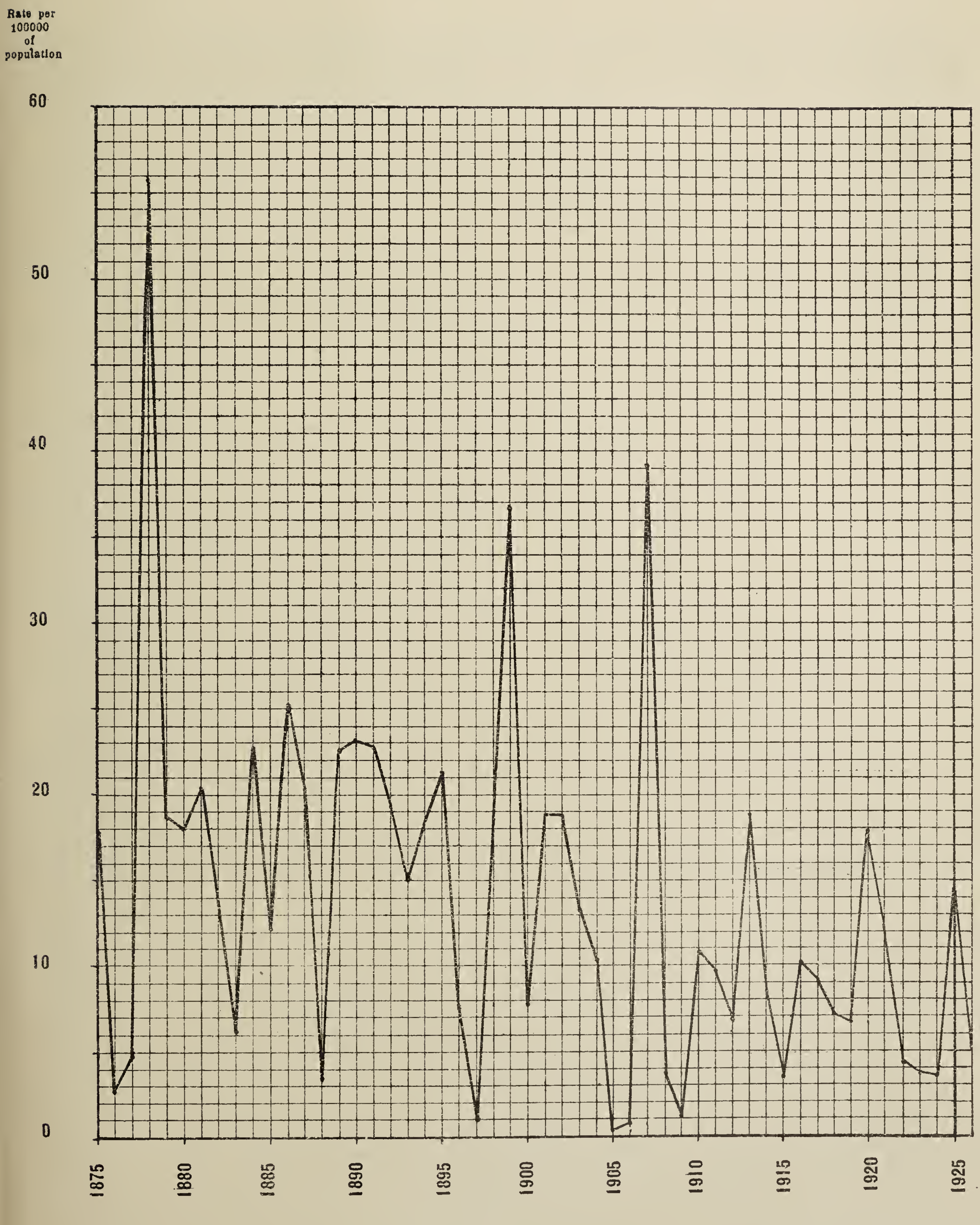
WHOOPING COUGH.

ANNUAL DEATH RATE PER 100,000 OF POPULATION

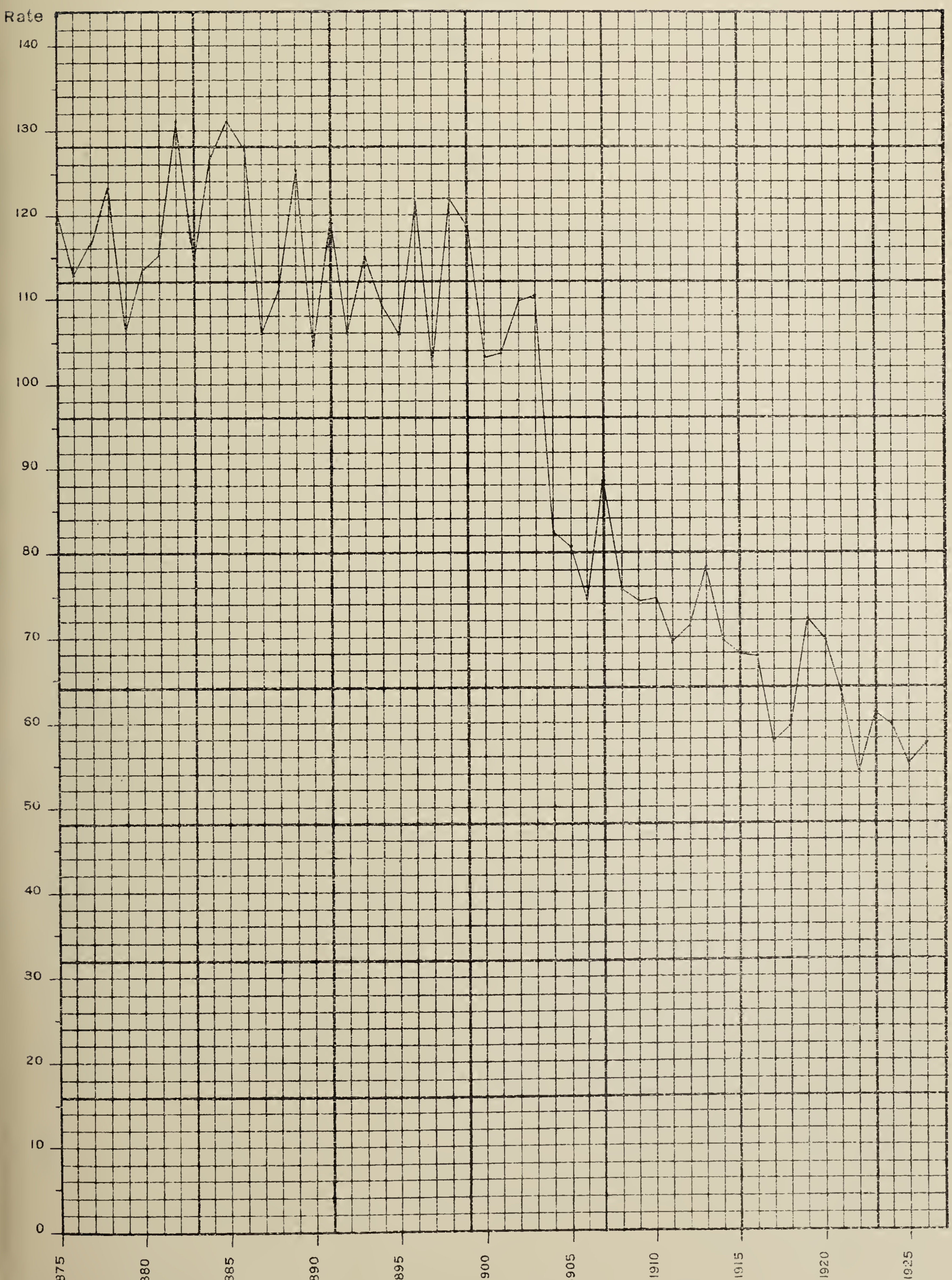
IN

NEW SOUTH WALES,

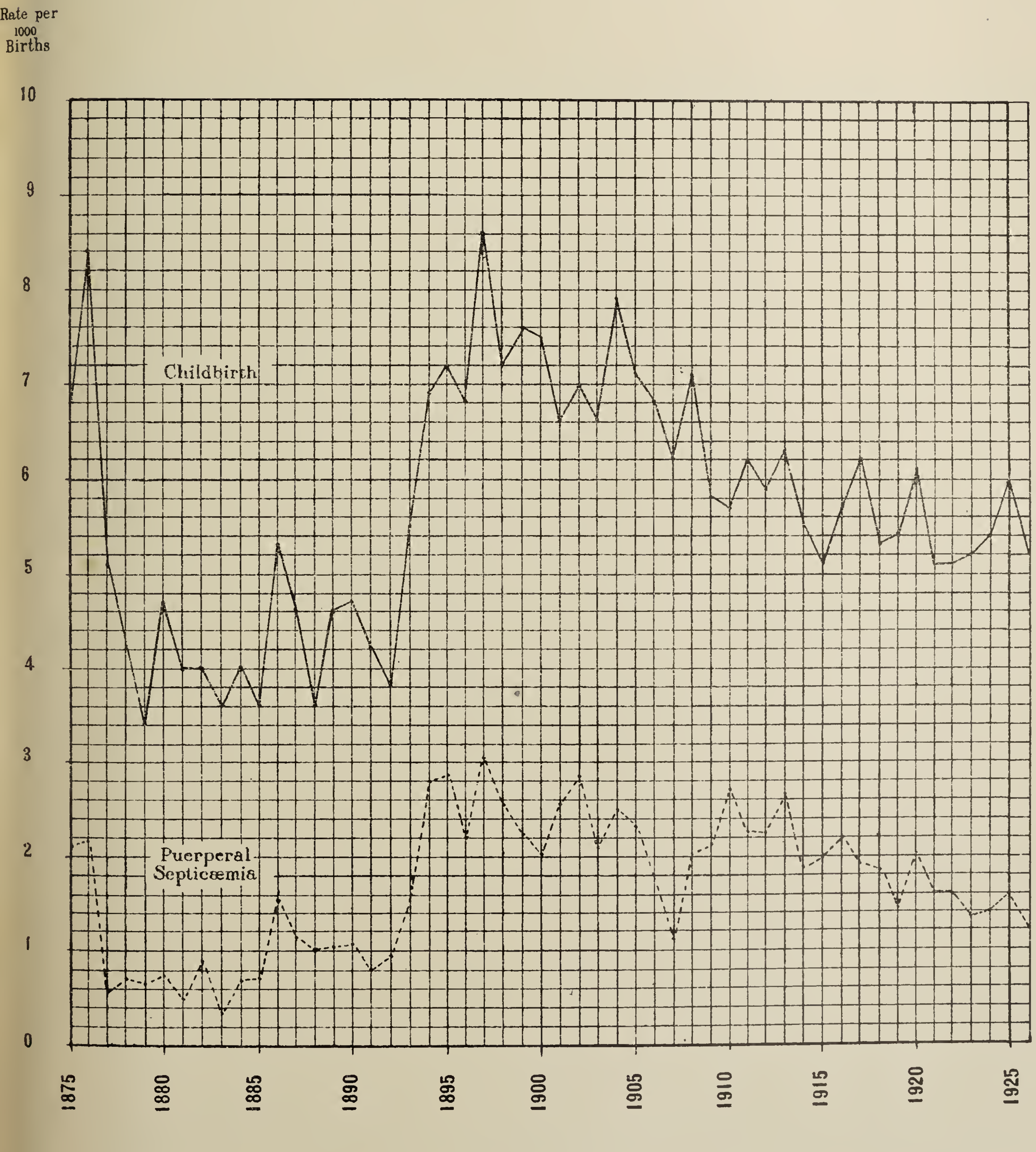
1875-1926.



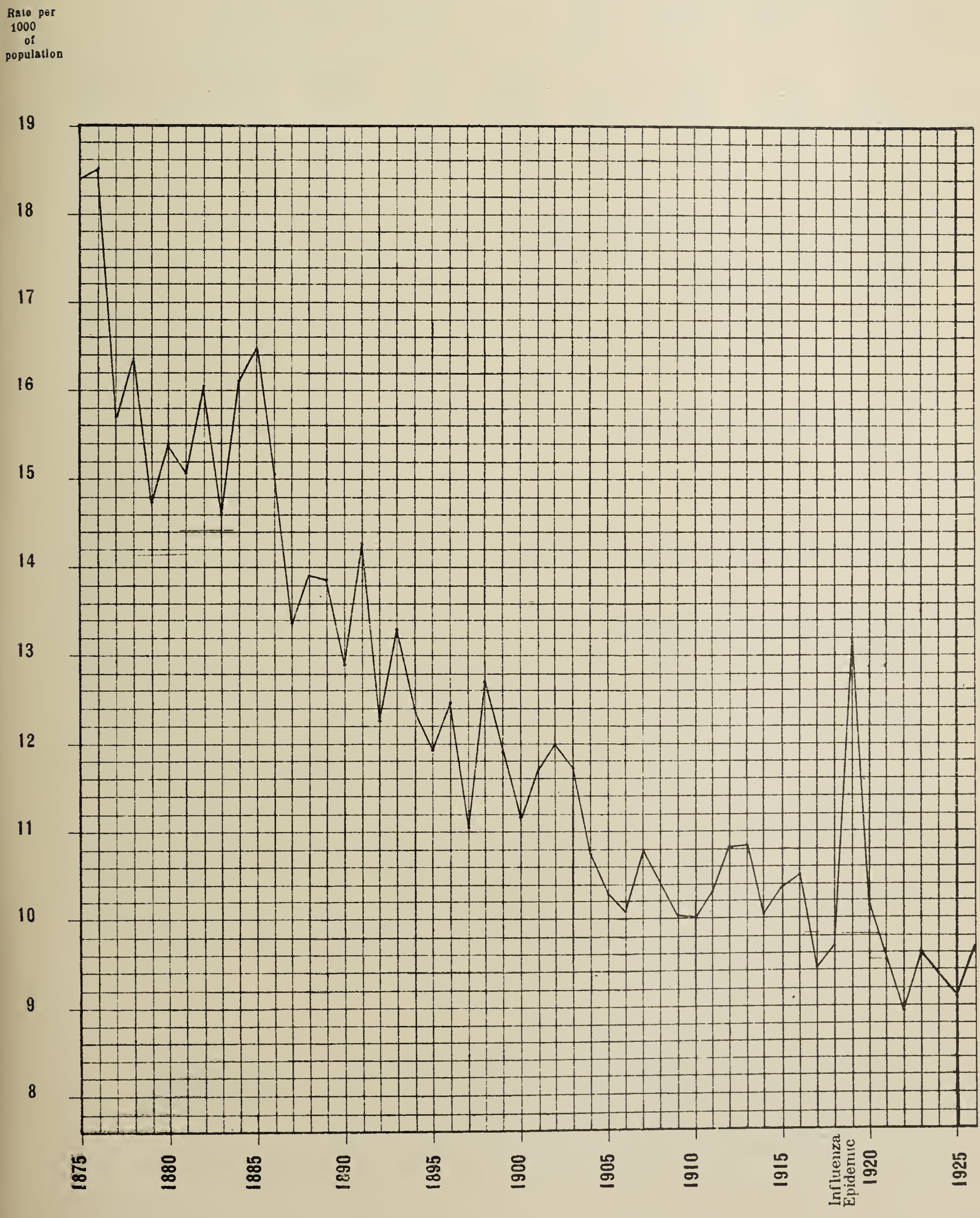
INFANTILE MORTALITY
ANNUAL DEATH RATE OF CHILDREN UNDER 1 YEAR PER 1,000 BIRTHS
IN
NEW SOUTH WALES
1875-1926.



CHILDBIRTH AND PUERPERAL SEPTICÆMIA.
ANNUAL DEATH RATE OF WOMEN PER 1,000 BIRTHS
IN
NEW SOUTH WALES,
1875-1926.



ANNUAL DEATH RATE PER 1,000 OF POPULATION
IN
NEW SOUTH WALES,
1875-1926.



VENEREAL DISEASES ACT, 1918. (6th Report.)

REPORT BY THE COMMISSIONER, Dr. ROBERT DICK, FOR THE YEAR ENDED 31st DECEMBER, 1926.

Six thousand and one notifications of venereal diseases were received in 1926, an increase of 687 on the number notified in 1925. This increase was probably mainly due to the issue of a circular to medical practitioners late in 1925 directing attention to their responsibilities under the Act and of the legal necessity of notifying all cases of venereal disease. A penalty not exceeding £20 is stipulated for a first conviction for failure to notify, and £100 for any subsequent offence.

In Table I below the annual cases notified since 1920, and the number of cases reported for failure to continue treatment are shown.

Table I.

Year.	Cases Notified.			Total.	Cases Reported for Failure to Continue Treatment.			
	Syphilis.	Gonorrhœa.	Other Venereal Diseases.		Total No. Reported.	Letters Returned Undelivered.	Treatment Resumed.	Cases not Finalised at 31 Dec.
1920 (Dec. only)...	683	1,340	215	2,238	....	....	.....	.....
1921	2,055	6,667	683	9,405	2,472	1,286	906	280
1922	1,270	4,516	512	6,298	1,992	997	628	367
1923	1,240	5,115	474	6,829	1,749	964	545	240
1924	968	4,628	494	6,090	1,354	651	422	281
1925	1,015	3,933	366	5,314	955	538	241	176
1926	1,179	4,491	331	6,001	1,060	593	280	187

The 1,179 cases of syphilis notified in 1926 comprised males 920, females 259; gonorrhœa, 4,491 cases (males 3,983, females 508); under other forms of venereal disease 331 (males 322, females 9) are included 6 cases of gonorrhœal ophthalmia. In the notified cases the proportion of males to females suffering from syphilis remained practically the same as in previous years, being 3·55 to 1 in 1926, compared with an average of 3 to 1 in previous years. There was, however, a marked difference in the sex ratio for gonorrhœa. In previous years the incidence in notified cases has been about 10 males to 1 female (1923, 10·7 to 1; 1924, 9·17 to 1; 1925, 10·27 to 1). In 1926 the ratio was 7·84 males to 1 female.

No reliable inference can be drawn from the variation of this ratio, chiefly owing to the fact that notification of this disease is neither thorough nor universal.

The Act intentionally places the responsibility for notification (which is by number only) on the medical practitioner. If he fails, for any reason, to carry out his duty the whole basis of accurate statistics is nullified. In consequence conclusions based on the proportion of male to female patients can only have a broad general significance. Apart from its annual fluctuations this ratio indicates that either the females do not seek treatment to the same extent as the males or that infection is spread to several males by each female before she comes under treatment.

On general grounds one would be justified in concluding that there is a certain amount of truth in both statements, but the exact position is a matter of conjecture. The increasing attendances at the female clinic at the Rachel Forster Hospital for Women and Children may account, in part, for the improved ratio, but this can only be verified by further experience.

Of the 6,001 notifications received, 3,332 were from public hospitals, and 2,599 from private practitioners; from the latter source there was an increase of 617 notifications (1,982 in 1925), which in all likelihood was mainly due to the issue of the circular referred to above. This shows the lack of reliability of notifications as a basis from which to draw valid conclusions concerning the incidence of venereal diseases in the community. An increase in the number of notifications may not necessarily imply an increased number of infections, but merely that medical practitioners have notified their cases more regularly or more effectively. In other words there is, apparently, in the community a considerable number of cases which do not appear in the annual statistics of the disease owing to the failure of the attending medical practitioner to notify. The reasons underlying this attitude of the profession are varied.

Some regard notification in this instance as inherently futile, or, at least, useless, as a means of prevention. Some regard it as irksome, others as involving future responsibility without evident benefit, and still others, perhaps, act on the basis that "the least said the better." The result is obvious. In the absence of reasonably complete notification it is impossible accurately to gauge the problem, and any future proposal for control of these diseases may be based upon incorrect evidence.

It will be seen from Table III appended that 93 per cent. of the 6,001 notifications were received from the metropolitan area. The division of the cases into notifying districts is shown below :—

	Population.	Notified Cases.			
		Syphilis.	Gonorrhœa.	Other Venereal Diseases.	Total.
Metropolitan Area	1,070,510	1,128	4,160	326	5,614
Newcastle District	98,850	9	48	....	57
Remainder of State	1,180,041	42	283	5	330
	2,349,401	1,179	4,491	331	6,001

Table III shows what has been clearly recognised in all countries—that venereal disease is essentially a problem of the large city. The disparity between the number of notifications received for the metropolitan area compared with the remainder of the State is very striking.

The factors underlying this phenomenon open up large questions involving social, economic and other considerations which are too vast for detailed discussion in this brief survey.

So far as can be ascertained the spread of venereal disease in Australia is not in the main the result of commercialised vice. Professional prostitution undoubtedly exists, but it has not—owing to economic and other causes—assumed the magnitude of older countries. Our problem arises from sexual promiscuity, which is encouraged, in large degree, by the conditions of city life.

The attractions of a large city, with its comparative freedom from gossip and criticism, its opportunity for the "gay life," its scramble for luxury, and all forms of amusement tend to blunt—in many instances—the finer susceptibilities and to lower the standard of sexual rectitude.

In the Table showing Age and Sex Incidence (Table IV) a disquieting feature is the increase in the number of female children and young girls suffering from gonorrhœa, the figures in the age-groups 0-20 being just double those for 1924. A comparative Table is given below for the years 1924, 1925, and 1926 :—

Year.	Gonorrhœa Incidence, Age-groups, 0–20 Years.								Total.	
	0–5 years.		6–10 years.		11–15 years.		16–20 years.		1–20 years.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1924	3	21	10	22	15	13	554	79	582	135
1925	1	24	2	15	17	22	544	92	564	153
1926	4	39	3	32	18	60	618	137	643	268

Failure to continue under treatment.—The Act provides that notification shall not disclose the name and address of the patient. In the event, however, of a patient failing to continue under treatment until cured, provision is made for his name and address to be forwarded to the Commissioner for necessary action to secure resumption of treatment. In 1926 the names and addresses were sent in of 1,060 persons who had failed to continue under treatment. Of these 280 resumed treatment in response to representations; 187 were still under investigation at the close of the year, and 593 (56 per cent.) could not be traced. It is probable that a number of the persons reported annually for discontinuance of treatment are visitors from overseas or from other States or country districts, and are under treatment elsewhere. Undoubtedly, also, patients realise that they control the position. If they wish to avoid any future complications arising from their discontinuation of treatment they have only to give a false name or address, or both.

CLINICS.

Metropolitan District.—No additional clinics were opened in 1926. At present there are eight clinics in operation, all of them in association with one or other of the public hospitals; at two of the clinics (Coast Hospital) syphilitic males only are treated. The clinic conducted at the Rachel Forster Hospital is for women only, and at present is open on two nights weekly ; its extension is contemplated, with a view to having a full-time clinic in operation at an early date.

From the figures below it will be seen that in comparison with 1925 there was a definite increase in the number of new patients suffering from gonorrhœa treated at the clinics, and a slight decrease in the patients suffering from syphilis.

NEW Patients treated at the eight Metropolitan Clinics during the years 1925 and 1926.

Year.	Gonorrhœa.			Syphilis.		
	Male.	Female.	Total.	Male.	Female.	Total.
1925	1,743	276	2,019	995	181	1,176
1926	1,968	460	2,428	824	258	1,082

Attendances at the male clinics numbered 55,219 in 1926, an increase of 7,625 on the figures (47,594) for 1925; at the clinics for women there was a decrease of 19 on the attendances for 1925, the figures being 1925, 11,506; 1926, 11,487.

As pointed out in previous reports the accommodation available at some of the clinics is not suitably planned, more often than not the ordinary out-patient department being used for the purpose. Under these circumstances continuous clinics cannot be held: and frequently too many attend the widely spaced sessions to permit of each patient being dealt with in the most satisfactory and expeditious manner. Provision of funds for the equipment of one or more suitably planned continuous clinics in the Metropolitan area is an urgent need.

Newcastle District.—Although plans and estimates of the proposed clinic for the treatment of venereal diseases at Newcastle Hospital have been drawn up, no adequate provision had been made up to the end of 1926 for the treatment of these diseases at this important seaport city. It is estimated that provision is needed to deal with 12,000 attendances, and about 600 new cases annually. At the close of the year negotiations were proceeding between this Department, the Federal Health Department, and the Board of the Newcastle Hospital in regard to the provision of funds for this urgently necessary work.

In this connection attention is drawn to Resolutions 28 and 29 passed at the first session of the Federal Health Council held in Melbourne in January, 1927, viz. :—

> "*Resolution* 28.—*Provision for Treatment of Venereal Diseases.*—That this Council considers that the establishment of venereal disease clinics or other provision for treatment at seaports would be carried out by the States more suitably than by the Commonwealth. It also considers that subsidies by the Commonwealth should be given towards the erection of seaport clinics.
>
> "*Resolution* 29. *Supply of Drugs to Sailors.*—That the State Department of Health will undertake to supply free drugs to carry sailors on to the next port and thus enable the Commonwealth to sign the international agreement."

Ante-natal Supervision and Treatment.—Efforts made to secure the co-operation of the large maternity hospitals in having tests made of the blood of expectant mothers attending the pre-maternity clinics have met with little success. Undoubtedly these tests are of the greatest importance, and should be included in the routine of ante-natal supervision. The testing of the mother's blood would reveal existence of infection in time to institute appropriate treatment, and ensure the probable birth of a healthy infant.

Expenditure, 1926.—£9,000 was spent from the special appropriation towards expenses under the Venereal Diseases Act. Of this amount £3,438 was paid in grants to public hospitals towards the cost of special accommodation for the treatment of patients suffering from venereal diseases, and £1,493 for drugs supplied free by this Department for the treatment of these diseases.

In addition to these amounts there is a considerable outlay in the treatment of patients in the venereal disease wards at the Coast Hospital, and the Liverpool and Newington State Hospitals. In 1926 the cost of maintenance of venereal disease patients at these hospitals amounted to £9,430.

Pathological Examinations.—Table VI shows the increased use made of laboratory tests for diagnostic purpose and for checking the results of treatment. In 1926, 11,621 serological tests were made on 6,035 specimens compared with 8,831 tests on 5,186 specimens in 1925. In addition 3,372 smears were examined for detection of gonococci, an increase of over 35 per cent. on the figures (2,487) for 1925.

Prosecutions.—No legal proceedings were taken during 1926.

Educational Propaganda.—Considerable progress has been made in this direction by distribution of leaflets and posters, and by talks and lectures. The Department received on loan from the British Social Hygiene Council the films "Gift of Life," "Social Hygiene for Women," "Waste," "Memories," "The Flaw," and "Whatsoever a Man Soweth ;" and the film "Well-born" was purchased. These films have been shown extensively in conjunction with addresses and lectures on the subject of sex hygiene. In its propaganda work the Department has been assisted by members of the Racial Hygiene Centre, the Father and Son Welfare Movement, and other public spirited citizens who have helped considerably by organising meetings and distributing literature.

The following Tables are appended :—

Table II.—Notifications received, 1923–1926.
Table III.—Notifications received arranged in order of notifying district.
Table IV.—Return showing forms of disease and age and sex of patients notified during 1926.
Table V.—Monthly return of cases notified during 1926.
Table VI.—Diagnostic examinations, 1920–1926.
Table VII.—Summary of Annual attendances at Public Clinics, 1920–1926.

Table II.—Notifications received 1923-1924-1925-1926 from Public Hospitals and Private Practitioners.

	Public Hospitals.				Private Practitioners.			
	1923.	1924.	1925.	1926.	1923.	1924.	1925.	1926.
Gonorrhœa	2,925	2,196	2,450	2,544	2,190	2,432	1,483	1,947
Syphilis	969	751	829	784	271	217	186	395
Other forms of Venereal Disease	278	240	53	74	196	254	313	257
	4,172	3,187	3,332	3,402	2,657	2,903	1,982	2,599

Table III.—Notifications received during 1923–1924–1925–1926, arranged in order of districts.

	Metropolitan Area.				Newcastle District.				Remainder of State.			
	1923.	1924.	1925.	1926.	1923.	1924.	1925.	1926.	1923.	1924.	1925.	1926.
Gonorrhœa	4,774	4,313	3,611	4,160	43	42	96	48	298	273	226	283
Syphilis	1,162	896	968	1,128	36	33	25	9	42	39	22	42
Soft chancre	95	74	42	50	2	......	......	......	3	2	1	1
Gleet	330	577	290	257	11	......	......	......	6	9	5	3
Gonorrhœal warts	16	17	20	12	......	......	1	......	1	......	......	...
Gonorrhœal ophthalmia	2	5	1	5	......	......	1	......	......	1	3	1
Venereal granuloma	8	9	......	2	......	......	1	......	......	......	1	...
Total	6,387	6,090	4,932	5,614	92	75	124	57	350	324	258	330

TABLE IV.—Return of cases of Venereal Disease notified during 1926, showing forms of disease, and age and sex of patients.

	0 to 5.		6 to 10.		1 to 15.		16 to 20.		21 to 25.		26 to 30.		31 to 35.		36 to 40.		40 to 45.		46 to 50.		Over 50.		Age not stated.		Total.		Total,
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Gonorrhœa	4	39	3	32	18	60	618	137	1,176	90	901	70	498	36	372	19	193	13	103	5	82	5	15	2	3,983	508	4,491
Syphilis	16	13	7	7	8	7	37	13	105	42	153	52	163	38	116	25	101	11	72	30	135	15	7	1	920	259	1,179
Soft chancre	...	...	...	...	...	...	4	...	13	1	13	...	5	...	7	...	3	...	3	...	2	...	...	...	50	1	51
Gleet	...	...	...	...	...	...	18	...	31	...	75	...	73	...	35	...	15	...	10	...	3	...	...	...	260	...	260
Venereal warts	...	...	...	...	...	...	1	1	3	...	1	...	2	...	3	...	...	...	1	...	...	...	...	...	11	1	12
Gonorrhœal ophthalmia	...	5	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5	6
Venereal granuloma	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	20	57	10	39	26	67	678	156	1,329	133	1,113	124	741	74	533	44	312	24	180	35	222	20	22	3	5,225	776	6,001

TABLE V.—Monthly return of cases of Venereal Disease notified during 1926.

		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Gonorrhœa	Male	397	263	425	273	350	350	259	339	369	367	295	296	3,983
	Female	40	40	69	46	67	35	30	61	28	51	29	12	508
Syphilis	Male	71	53	69	66	108	112	55	102	81	60	62	81	920
	Female	17	23	22	30	26	20	12	29	15	33	24	8	259
Soft chancre	Male	...	3	6	9	13	4	7	3	2	1	1	1	50
	Female	...	1	...	...	...	...	...	...	...	...	...	...	1
Gleet	Male	32	19	44	29	17	23	16	11	23	18	15	13	260
	Female	...	...	...	...	...	...	...	...	...	...	...	...	...
Venereal warts	Male	...	...	2	3	...	...	2	...	1	2	...	1	11
	Female	...	...	...	...	...	...	...	...	1	...	...	...	1
Gonorrhœal ophthalmia	Male	...	...	...	...	...	1	...	...	...	...	...	...	1
	Female	...	...	2	...	...	1	...	...	...	...	...	2	5
Venereal granuloma	Male	...	...	...	...	...	...	...	...	...	...	...	...	...
	Female	...	...	...	...	...	...	2	...	...	...	...	...	2
		557	402	639	456	581	546	383	545	520	532	426	414	6,001

TABLE VI.—Diagnostic examinations for Venereal Diseases made in the Microbiological Laboratory during the years 1920-1926.

Year.	Gonorrhœa. (Smears and Urine.)	Gonorrhœa. (Complement (Deviation Test.)	Syphilis. (Wassermann Reaction.)	Syphilis. (Kahn's test.)	Syphilis. (Smears for Spirochætes.)
1920	1,012	......	2,270	......	......
1921	2,196	......	2,488	......	......
1922	1,981	......	2,537	......	22
1923	1,919	......	2,431	......	25
1924	2,261	1,265	3,674	......	10
1925	2,487	1,585	5,186	2,060	16
1926	3,372	2,145	6,002	3,464	11

TABLE VII.—Summary of Annual Attendance Returns at Public Clinics for treatment of Venereal Diseases, 1920–1926.

Year Ended.	Attendances.			New Cases.					
				Gonorrhœa.			Syphilis.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
Royal Prince Alfred Hospital.									
31 December, 1920	3,147	1,031	4,178	62	21	83	33	31	64
31 ,, 1921	15,420	4,303	19,723	337	139	476	156	94	250
31 ,, 1922	17,298	4,498	21,796	523	129	652	235	101	336
31 ,, 1923	20,043	4,141	24,184	603	140	743	186	111	297
31 ,, 1924	20,993	4,880	25,873	657	146	803	219	111	330
31 ,, 1925	21,242	4,915	26,157	558	119	677	137	80	217
31 ,, 1926	23,694	3,090	28,784	556	129	685	170	83	253
Sydney Hospital.									
31 December, 1920	2,061	207	2,268	222	...	222	94	14	108
31 ,, 1921	15,565	1,120	14,685	1,335	...	1,335	420	52	472
31 ,, 1922	12,385	493	12,878	1,154	...	1,154	244	12	256
31 ,, 1923	15,265	2,277	17,542	1,412	80	1,492	304	68	372
31 ,, 1924	13,829	2,863	16,692	719	45	764	233	93	326
31 ,, 1925	12,896	2,527	15,423	972	51	1,023	204	60	264
31 ,, 1926	16,075	2,806	18,881	1,264	64	1,328	217	82	299
Royal Alexandra Hospital for Children.									
31 December, 1920	Returns not available.								
31 ,, 1921									
31 ,, 1922	...	...	4,143	2	33	35	23	18	41
31 ,, 1923	...	...	4,284	...	41	41	22	23	45
31 ,, 1924	469	2,000	2,469	3	25	28	19	16	35
31 ,, 1925	333	1,742	2,075	......	25	25	20	17	37
31 ,, 1926	361	1,830	2,191	1	42	43	15	21	36
Royal South Sydney Hospital.									
31 December, 1920	Returns not available.								
31 ,, 1921									
31 ,, 1922	2,049	2	2,051	123	...	123	17	1	18
31 ,, 1923	1,958	21	1,979	127	...	127	23	2	25
31 ,, 1924	1,787	35	1,822	121	...	121	36	6	42
31 ,, 1925	2,355	......	2,355	125	...	125	30	...	30
31 ,, 1926	1,744	73	1,817	91	...	91	18	7	25
Royal North Shore Hospital.									
31 December, 1920	Clinic first opened in August, 1922.								
31 ,, 1921									
31 ,, 1922	67	18	85	5	...	5	3	9	12
31 ,, 1923	563	366	929	60	...	60	5	15	20
31 ,, 1924	2,663	375	3,038	91	9	100	11	17	28
31 ,, 1925	3,365	707	4,072	88	7	95	9	9	18
31 ,, 1926	4,267	1,421	5,688	56	25	81	13	8	21
Coast Hospital Night Clinics for Syphilis (Men only).									
1. Hospital Admission Depôt, Head Office (Coast Hospital Staff).									
	Clinic first opened in August, 1924.								
12 August to 31 December, 1924	1,290	...	1,290	...	...	...	229	...	229
31 December, 1925	6,704	...	6,704	...	...	...	595	...	595
31 ,, 1926	7,565	...	7,565	...	...	...	391	...	591
2. *Coast Hospital, Little Bay.*									
	Clinic first opened 29th June, 1925.								
29 June to 31 December, 1925	699	...	699	...	...	...	Information not available.		
31 December, 1926	1,513	...	1,513	...	...	...			
Rachel Forster Hospital for Women and Children.									
	Clinic first opened in 1923.								
31 December, 1924	...	1,000	1,000	...	73	73	...	33	33
31 ,, 1925	...	1,615	1,615	...	74	74	...	15	15
31 ,, 1926	...	2,267	2,267	...	200	200	...	57	57

SECTION I.—C.

Industrial Hygiene.

Medical Officer of Industrial Hygiene—CHARLES BADHAM, B.Sc., M.B., Ch.M., D.P.H.
Engineer Assistant—C. F. ASSHETON, B.E.
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STUDIES IN INDUSTRIAL HYGIENE.

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*Serial No. 1.—Textile Industry, Sydney, New South Wales, Investigation into the Health and Factory Conditions of certain Textile Workers.	Ann. Rept., Dir.-Gen. Pub. Health, 1923. p. 27.		
2.—An Investigation concerning the Ventilation and Sandstone Dust present in the Air of certain Sewer Tunnels under Construction at North Shore, and in other Sandstone Workings.	Ann. Rept., Dir.-Gen. Pub. Health, 1924, p. 52.		
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Studies in Industrial Hygiene, No. 10.

On the Index of Comfort in the Ventilation of Theatres in Sydney, New South Wales.

By C. Badham, Medical Officer of Industrial Hygiene; C. F. Assheton, Engineer Assistant; and H. E. Rayner, Physicist Assistant; of the Division of Industrial Hygiene, N.S.W.

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Introduction and Conclusions.

This investigation was commenced in March, 1925, at the request of the Director-General of Public Health. Little apology need be offered for incorporating the results in our series of *Studies in Industrial Hygiene*, for the work which has been undertaken has a direct application to certain industrial activities where sedentary work is performed. Already one of us had formulated a standard of air movement required to produce comfort in textile mills, [*]and this publication may be regarded as an extension of that work and as a preliminary to the investigation of other industrial activities, particularly those in which a higher range of temperatures may be met with.

In the present investigation, during the first year of our work, observations of air movement and temperature were made in most of the theatres and picture-shows in the city. When an attempt was made to co-ordinate the data collected, it was found on trying to determine the air movements necessary at different temperatures and humidities to produce comfort, that we had not paid sufficiently close attention to the judgment of the comfort of the various atmospheric conditions which had been met with, so that our system of voting had not proved effective. We had not exercised sufficient care in determining the comfort or otherwise of the conditions we investigated. Again, on considering apparently conflicting data collected from different theatres having different degrees of ventilation, it appeared that the air supply per person was a factor that should be known, so that similar conditions might be compared. It was also surmised that probably different theatres had different characteristics which could not be appreciated from the few inspections that were made at each theatre during the investigation of 1925–26.

Believing these factors to be of sufficient importance to preclude a correct conclusion being drawn from the data collected, the work was continued and received the closer attention it merited.

The preliminary survey and the training in the first part of the investigation prompted us practically to confine our attention to two theatres, namely, St. James and Her Majesty's Theatres. These theatres were two of the largest in Sydney, and of approximately equal seating capacity. In St. James Theatre, which had been recently constructed, a ventilation plant which was completely under control had been installed, and was capable of providing a large air supply per person. In Her Majesty's Theatre the mechanical ventilating plant was of low capacity and rarely in operation, so that the investigation included a comparison between (*a*) A theatre provided with a completely controlled mechanical system of ventilation capable of providing a large air supply per person, and (*b*) One which on most occasions could be regarded as relying upon natural ventilation and providing a comparatively small air supply per person.

The difficulty of interpreting the relative degrees of comfort from such remarks as were applied in our early observations was apparent, and during this investigation marks were assigned to the various sensations of air movement experienced, in accordance with a scheme used by Vernon which was published about this time.[†]

As it was thought that observations receiving the same "comfort vote" would represent equal conditions of comfort, the assigned marks, or "comfort votes" as we have called them, were noted when Kata thermometer readings were taken at any spot in the theatre. The votes were recorded independently by the two investigators who were responsible for the Kata thermometer observations, and were usually supplemented by the vote of one or more of us who might be making other observations in the vicinity. The vote was not influenced by any previous knowledge of the air movement.

The exhaust rate of the mechanical plant at St. James Theatre was determined by anemometer readings across the fan cubicles in order to calculate the air supply per person in the theatre. The carbon dioxide concentration of the exhausted air, also that of samples collected in the theatre, was determined with portable apparatus in order to investigate the value of carbon dioxide standards frequently embodied in ventilation regulations, and to compare the amount of air supply per person as computed from the carbon dioxide concentration with the figure obtained from the knowledge of the rate of exhaust of the fans.

Carbon dioxide readings were also taken at Her Majesty's Theatre where, however, the exhaust fan was not accessible for anemometer readings.

All wet and dry bulb temperatures were taken with a sling psychrometer, which was selected both on account of the rapidity with which observations could be made and the fact that the determination of the humidity is more accurate by this instrument than when using stationary thermometers.

The second series of observations was commenced in April, 1926, and terminated in the middle of March, 1927, the survey thus nearly covering a period of one year.

A critical examination of the data collected by us (Appendix V) during this period, which is incorporated in the 226 complete observations, will reveal some contradictory results. These have not been discarded; they represent anomalies brought about by difficulties of technique in crowded and darkened

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[*] An Investigation into the Health and Factory Conditions of certain Textile Workers.—Annual Report of the Director-General of Public Health, 1923.

[†] Methods of Investigating Ventilation and its effects, by H. M. Vernon and others.—Medical Research Council, 1926, Special Report Series No. 100, page 35.

Sensations of air movement experienced.	Marks assigned.
Very Stagnant ...	0
Very Stagnant to Stagnant ...	1
Stagnant ...	2
Stagnant to Medium ...	3
Medium ...	4
Medium to Fresh ...	5
Fresh ...	6
Fresh to Very Fresh ...	7
Very Fresh ...	8

theatres, and the personal equation in judging degrees of comfort according to a set scale. But despite the handicap of these factors, which introduce unavoidable errors, nevertheless, in our opinion, the data obtained amply justifies our conclusions.

A small amount of work was done in investigating the bacteriology of the air at both theatres, but this method of investigation was not pursued.

We have determined the air movements required at various absolute humidities and dry-bulb temperatures to give comfort in Sydney theatres. Taking average conditions of absolute humidity, that is 5 grains per cubic foot, the equation of comfort for Sydney theatres is $(T-60) = 9 \cdot 5 \log_{10} 2 (a-15)$, where T = dry-bulb temperature in degrees F.; a = air movement in feet per minute.

The air movements have been computed according to the new calibration of the Kata thermometer.*

Appendices Ia, Ib, II give the results of our determinations for various conditions.

A comparison of our work with that of Vernon and his co-workers in England, and with Yaglou and his colleagues in America will reveal that we find ourselves in closer agreement with Vernon than with Yaglou. The English school appears to have devoted less attention than it behoves us to pay to the question of varying absolute humidity, while the American school does not appear to have appreciated full value of low-air movements in the production of comfort for sedentary subjects.

Our present theatre regulations require eight changes of air per hour in any theatre, and take no cognizance of the number of the audience and the volume of air per person. Thus a theatre with a large volume per person is compelled to change the entire volume of air in the theatre as many times as a theatre with a smaller volume per person. We suggest the supply of a definite number of cubic feet of fresh air per person per minute, associated with a definite air movement.

We recommend that regulations for the ventilation of Sydney theatres should provide for:—

1. An air movement according to the curve (Appendix Ia) showing the air movements required to produce comfort between temperatures of 60 deg. and 80 deg. Fah., at an absolute humidity of 5 grains per cubic foot. The air movement to be procured by electric fans, or other means and the machinery providing such movement to be capable of producing higher air movements to take care of occasional higher, if not of extreme humidities.
2. An air supply according to the outside dry-bulb temperature. When the outside temperature is below 55 deg. F., not less than 15 cubic feet per person per minute; when the outside temperature is between 55 deg. F. and 65 deg. F., not less than 20 cubic feet per person per minute, and when the outside temperature is above 65 deg. F., not less than 30 cubic feet per person per minute. The air supply to be produced by natural and/or other methods of ventilation.

The above recommendation would require in most Sydney theatres an air change varying from six times per hour in midwinter to 12 times per hour in summer. The theatre temperatures would vary from about 63 deg. F. when the outdoor temperature was 50 deg. F. to 80 deg. F. when the outdoor temperature was 75 deg. F.

Artificial heating of theatres is not practised in Sydney.

We have been greatly assisted in this investigation by Mr. S. R. Stoney, L.S.I., Sanitary Inspector, who has carried out the Kata and thermometer readings at our instigation, and whose experience in the inspection of theatres, &c., has been of great service to us, and he has been ably assisted in this work by Mr. Simms of the Department of Public Health.

SECTION II.—NOTES ON THE DEVELOPMENT OF OUR CONCEPTIONS OF THE PRINCIPLES OF VENTILATION.

The lethal effects of confined spaces to man and other animals had been known long before Lavoisier, in 1775, determined the composition of air, and put forward the theory that the feelings of discomfort in crowded rooms were due to an excess of carbon dioxide rather than to a decrease of oxygen. This carbon dioxide theory took a firm hold in scientific circles despite an attempt by Heberden, in 1825, to explain the discomfort found in crowded places by the physical rather than the chemical condition of the atmosphere.

Until 1862 carbon dioxide was accepted as the producer of discomfort in confined spaces, but in this year Pettenkofer showed that the increase of carbon dioxide was no more responsible than the diminution of oxygen for the ill effects of vitiated air. Pettenkofer introduced the idea that a measurement of carbon dioxide in the air afforded a convenient index of the extent of vitiation of the air by some unknown organic substance produced by animal bodies, which accounted for the discomfort experienced in badly ventilated places. Then began the era of "*crowd-poison*" or speculations into the effect of the hypothetical toxic organic substances in respired air, of which Brown-Séquard was the chief apostle in the last quarter of the last century.

Pettenkofer suggested ten parts of carbon dioxide per ten thousand parts as a permissable amount of carbon dioxide in the air, which would indicate that the accumulation of the substances (later known under the general term "*crowd-poison*") was not excessive.

In 1875 De Chaumont, of the Netley Army Medical School, taking the absence of closeness or smell as his guide, fixed the carbon dioxide limit at six parts per ten thousand. The standards of Pettenkofer and De Chaumont have held the stage long after the original reason for them was found fallacious, the same standards are still used in general hygienic regulations, but for different reasons. Such standards require a change of air in any inhabited room so that microbic infection of respiratory disease may possibly be less easily effected and that at certain low temperatures the body heat may not become excessive. Standards of six to ten parts of carbon dioxide may or may not produce comfort; their chief value is that they compel air change.

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* Medical Research Council, Special Report Series 100—Method of Investigating Ventilation and its Effects—by H. M. Vernon, and others, London, 1926.

It is characteristic of all modern work in ventilation that the comfort of the individual has been taken as an index of good ventilation. Physiological and chemical analysis of altered metabolism, body heat, &c., may be all used in markedly uncomfortable conditions, but the absence of marked reactions of the human body is not a sufficient guide to comfort. There is no more delicate test of the healthiness or otherwise of any scheme of ventilation than the comfort of the individuals subjected to it.

The "crowd-poison" hypothesis was very tenacious in the public mind, and even to this day widely finds acceptance in the community.

Following the "crowd-poison" idea, there came into existence early in this century the conception that the physical and not the chemical properties of air caused feelings of comfort or discomfort.

Flugge and his co-pupils in 1905 studied the effects of temperature and humidity, and showed experimentally how these physical conditions were the chief factors in ventilation. They showed that the inability of the body to lose heat at the higher temperatures and humidities was responsible for discomfort, and that lower temperatures or the cooling effects of currents of air made for comfort, despite large amounts of carbon dioxide in the air.

Early in this century Haldane, in England, and his co-workers stressed the importance of the effect of high temperatures, and particularly of high humidities. In 1905 Haldane showed how the body temperature rose at high wet-bulb temperatures, and how in moving air this condition was not so evident. In the first decade of this century the classical work of Haldane and his colleagues stressed the chief problems of ventilation as the removal of excessive heat and moisture.

Probably no more important work in ventilation has been done than that of Hill and his colleagues, who stressed the need of suitable air movement to produce comfort. As a means of measuring comfort, by determining the rate of heat loss, Hill introduced the Kata thermometer, and showed how this instrument, with suitable variations, could be used to determine the rate of heat loss, and so the feeling of comfort. The application of this instrument devised by Leonard Hill in investigations into conditions of comfort in factories and other industrial activities and the haunts of man generally, has prospered, and it is very evident that his work has brought into being many important ideas expressed by Vernon and other English investigators, and that it has appealed to the scientific world, either as a means of determining standards of comfort or for measuring small degrees of air movement.

Bruce[*], of Sydney, in 1909 drafted the requirements of permissible humidity and temperature for the Factory Act of New South Wales, and took as a reliable index of pleasant and desirable conditions a dew point of 62 degrees Fah. This dew point equals an absolute humidity of 6·1 grains of moisture per cubic foot.

In using the dew point as an index of comfort Bruce raised the question of the value of the common meteorological practice of giving the relative humidity rather than the dew point or absolute humidity. In our view the more general adoption of the practice of stating dew point, or better still, the grains of moisture per cubic foot, would give a clearer appreciation of moisture in the atmosphere, which is the chief cause of unpleasant weather conditions in Sydney.

The use by Bruce of the absolute humidity as a means of determining comfort has in part been followed by us, but with the important addition that we have applied the more recent ideas dealing with the value of air movement in correcting the conditions of discomfort caused by increased humidities.

In dealing with the problem of the index of comfort for any locality, and in comparing the results obtained by workers in different parts of the globe, it should always be kept in mind that the basal metabolism or rate of production of body heat in the resting stage is at a lower level in individuals in warm or tropical places, and at a higher level in colder parts. This difference in basal metabolism is probably the measure of acclimatisation.

Recently Dr. Corlette[‡], of Sydney, has published a thoughtful article, entitled "On some Relations of Climate, Weather, and Fat Covering to Metabolism," and he has calculated for different places the heat loss by respiration of a man expiring 16 cubic metres per day.

To do this he has taken "the mean temperature and mean absolute humidity for the place and period." He states :—

> For a man engaged in a sedentary occupation and respiring 16 cubic metres per day the difference for some of the places come out as follows :—
>
> Table V.—Mean daily heat loss by respiration in various places for a type-individual respiring 16 cubic metres per day.
>
> For the year, for winter and for summer. The New York and Chicago figures are for the year 1917 only.

Place.	For the Year.	For Winter.	For Summer.	Winter-Summer Difference.
Rio de Janeiro	222	253	182	71
Sydney	302	345	254	91
Melbourne	331	360	304	56
London	362	403	310	93
New York	368	443	249	194
Chicago	382	459	262	197
	Calories lost per 24 hours.			

It has been suggested by Dr. James Kerr (and others) that possibly the high seasonal variations in the northern half of the United States have something to do with the inordinate optimum, about 70° F., fixed there for the indoor temperature.

Notes on the more recent work of ventilation by the English and American Schools are given in another section.

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[*] J. L. Bruce—"Moisture and Temperature in Air in Relation to Comfort and Health."—*Technical Gazette of New South Wales*, Vol. VI, 1917, Part I.

[†] Medical Research Council, Special Report Series 73—"The Kata Thermometer in Studies of Body Heat and Efficiency"—London, 1923.

[‡] Corlette C. E.—On some Relations of Climate, Weather, and Fat Covering to Metabolism—*Medical Journal of Australia*, 1923, February, 17th.

SECTION III.—RECENT WORK ON THE RELATION OF ATMOSPHERIC CONDITIONS TO COMFORT.

A. English Work.

Following on the publication by the Medical Research Council, in 1923, in Great Britain of *The Kata-Thermometer in Studies of Body Heat and Efficiency*, which resulted from the work of Hill, Ash, Vernon, Bedford and Angus, there came a very important report of the Medical Research Council, entitled "Methods of Investigating Ventilation, and its Effects," which carried on the investigation previously mentioned.

We owe this latter work to the activities of Vernon, Bedford, Warner, and Manley.

This publication deals in particular with "The Calibration of the Kata Thermometer," "The Influence of Cooling Power and of Variability of Air Currents on Sensations of Air Movement," and the "Influence of Temperature, Air Velocity, and Clothing on the rate of Cooling of the Human Body."

Hill and his colleagues† showed that it is not from the chemical impurity of the air that discomfort experienced in confined places results, but that it is due to inadequate heat loss. As the comfort or discomfort experienced in various places depends on temperature and air movement, the application of the Kata thermometer, which was specially designed to record the cooling power of the air, is indicated to test these conditions. These authors have formulated certain standard cooling powers.

The Kata thermometer, according to Leonard Hill, is "an instrument designed primarily for the measurement of its own rate of cooling when its temperature approximates to that of the human body." Leonard Hill obtained his standards by empirical graduation of the instrument in various atmospheric conditions which were considered comfortable. It is not to be thought that the cooling of the Kata thermometer is directly comparable with the clothed human body; moreover, the variations of the sweating mechanism of the human body and the physiological mechanism of increasing the heat loss by flushing the capillary blood vessels introduces factors which no single instrument is likely to be able to value correctly but it has been found that the dry Kata thermometer can estimate air movements, and that it is a much better index of ventilation than the wet and dry-bulb thermometers which are uninfluenced by moving air.

The second Medical Research Council* publication in ventilation deals with certain ingenious instruments devised by Vernon and Manley to measure the rapid oscillations of air velocity and air temperature. Vernon, himself, has undertaken a further calibration of the Kata-thermometer. He has shown that the Kata "factor" is not constant for any individual temperature, and he has determined the necessary corrections for a large range of temperatures. *We have used these new tables in our work.*

Hill and Hargood Ash in 1922, calibrated the Kata thermometer. The lower air movements were determined at air temperatures of 57 degrees Fah. by the whirling arm method; the higher air movements at 67 degrees Fah. by the wind tunnel method. It was found that the formula that covered the lower air movements did not hold for the higher air movements.

Vernon later obtained indirect evidence that the Kata formula did not hold equally well throughout a range of temperatures. Angus, in 1924, found that the Kata factor at high temperatures was much higher than at lower tenperatures, due to convection currents of hot air which are set up in the still air chamber, for these currents get less and less rapid the higher the temperature.

An investigation was carried out by Vernon, Bedford and Warner to determine the relationship between Kata thermometer readings and actual sensations of comfort. It is known that for low temperatures very little air movement is required to produce comfort, because the heat loss is effected fairly easily. Moreover the factor of acclimatization is a very real one, and the basal metabolism or rate of production of body heat in the resting stage is at a lower level in individuals living in warm or tropical localities, and at a higher level in those who are exposed to cold and open air life. Vernon and his fellow workers consider that there is a definite seasonal acclimatization quite apart from that due to clothes.

Part of Vernon's work has been the determination of sensations of air movement according to an agreed scale. He considers that his results tend to show that acclimatization is an important factor, and his conclusion is that Hill's cooling power of Kata 6 is a minimum requirement only at the lower temperatues for workers engaged in sedentary occupations. At the higher temperatures a cooling power of 5 will be quite reasonable.

Vernon has also studied the rate of cooling of the human body, naked and clothed, and the relative importance of air temperature, clothing and air movement.

An important series of papers by the American School (Houghton, Yaglou, Sayers, Miller, McConnell) has brought forward the data obtained by means of the two-chamber method and has given a series of charts. The authors have taken the three variables that go to make the conditions of a comfortable or uncomfortable atmosphere—dry-bulb temperature, humidity and air movement—and have combined these variables to a single figure. This figure which is called the "Effective Temperature," is that degree of temperature of saturated still air which approximates the comfort experienced at any combination of dry and wet bulb temperatures and air movement, within certain limits, more or less commonly experienced.

> "Effective Temperature is an index of the degree of warmth or cold felt by the human body as a result of temperature, humidity and movement of air. When the dry and wet bulb temperatures and the rate of air movement are known, the effective temperature can be computed from charts."†

If we were able to follow the American authorities and reduce these three variables to a single figure then we could compare the relative value of any one of the three, but unless we adopt this method we cannot measure the effect of the variation of any one of the three prime factors of comfort in ventilation dry-bulb, humidity and air movement. For this reason, the method devised by Houghton, Yaglou and Sayers, has many advantages.

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* Medical Research Council, Special Report, Series 100—Methods of investigating Ventilation and its Effects, by H. M. Vernon, and others. London, 1926.

† Journal of Industrial Hygiene, Vol. IX, 1927, p.254.

Vernon and his co-workers, following on the work of Leonard Hill, who devised the Kata thermometer, have done a great deal of work in determining Kata readings, which make for comfort in various conditions.

Broadly, it might be stated that the English school has paid great attention to the importance of *small air movements*, which can be measured very accurately by the Kata thermometer, while the American school has given attention in their research to the conditions of temperature and humidity in determining sensations of warmth. While both these schools have aimed to determine conditions of comfort there is some doubt if the sensations of air movement, recorded by Vernon, as making for comfort are comparable to the sensations of warmth and comfort described by the American school.

For ourselves, we feel that at temperatures between 70 degrees and 80 degrees Fah., comfort so closely depends on the factors, dry-bulb, humidity and air movement, that the sensations described by these two authorities are similar in nature.

To us it appears that the English school has paid less regard than it behoves us to pay to the question of absolute humidity, and that the American school has not fully appreciated the value of small air movement in the production of comfort.

Vernon is of the opinion that the two-chamber method of the Americans does not take account of acclimatization and seasonal changes. These changes were hard to measure, but from an empirical graduation, by means of many Kata readings in factories, Vernon and his colleagues consider that in order to produce a given sensation of air movement in the winter, it is necessary for the air to have a cooling power one unit higher than is required in the summer. They consider that the difference between summer and winter results were due partly to difference in the clothing, but chiefly to acclimatization.

These authors consider that " One advantage of effective temperature over dry Kata cooling power, lies in the fact that it takes account of the humidity of the atmosphere."

Vernon states that the clothing is of more importance than air movement in the cooling of the body, and his conclusions are :—

> " It will be gathered that no single index of comfort exists, nor is one likely to be evolved, for the reason that the skin of the body is sometimes dry, and sometimes moist from perspiration, and so it reacts very differently to atmospheric conditions. At the same time, it appears than under ordinary conditions the cooling power of the air, as estimated by the dry Kata thermometer, is a much better index than the effective temperature, because it automatically makes a considerable allowance for acclimatization. It does not allow enough, however, and therefore some further correction has to be made when comparing summer and winter cooling powers, but its readings are not greatly at variance with bodily sensations, as effective temperatures are. Under special circumstances the effective temperature is a better index than the cooling power, but it appears to me that such circumstances seldom occur in practice. It might be thought that they held when we passed from a hot room to the cold air outside, or *vice versa*; but they do not really do so, as we appropriately vary the clothing worn in order to neutralize the temperature differences.
>
> For men engaged in heavy muscular work the wet Kata cooling power is the best index; for men engaged in moderate work, therefore, both dry and wet Kata cooling powers have to be considered.*"

B. American Work.

Recent Work of the Bureau of Mines, the United States Public Health Services, and the American Society of Heating and Ventilating Engineers.

A critical appreciation of the large amount of work done during the last four years by the American schools and described by Sayers, McConnell, Yaglogiou, and others is beyond the scope of this monograph. Their work, which is of the greatest value, was carried out by using two large experimental chambers and has resulted in the construction of a series of charts from which it is possible to reduce temperature, humidity, and air movement to a common figure, which they have called " the effective temperature."

Houghton, Yaglogiou and Sayers† state that there are " three principal factors affecting loss of body heat, namely :—(1) Temperature, (2) Humidity, and (3) Air Motion."

As the temperature of the air and surrounding objects rises, the loss of heat by convection and radiation decreases. When the temperature reaches that of the body the loss by radiation and convection ceases. Finally, as the air temperature exceeds that of the body, heat passes from the air to the body.

If, on the other hand, the relative humidity is increased, the heat loss by evaporation decreases. If while the dry-bulb temperature increases the wet-bulb temperature decreases sufficiently, the increase in loss of heat by evaporation may be made equal to the decrease in loss of heat by radiation and convection, resulting in no change in body temperature or comfort.

From these premises it is concluded that there must necessarily exist certain combinations of temperatures and humidities which will produce the same total body heat, loss by radiation, convection, and evaporation; and therefore the same feeling of comfort or discomfort. Lines passing through such air conditions, plotted in the form of a psychrometric chart, may be called " equal comfort or effective temperature lines."

In this method of determining effective temperatures two experimental chambers were used. In one chamber the air was kept saturated, with no air movement, and in the other chamber the dry-bulb temperature and humidity would vary, and in the first part of the experiments no air movement was caused in this chamber, and in the second part of the experiments air movements were varied from 100 to 700 feet per minute.

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* Journal of Industrial Hygiene, Vol. VIII, 1926, p. 401.

† " The Effective Temperatures for Still Air Conditions and their Application to Mining." Bureau of Mines, Serial No. 2,563, 1924.

The observers entered the first chamber which was at saturated temperature of (say) 70 deg. Fah., and no air movement. After taking note of the feeling of warmth produced in this chamber they went into the second chamber where the dry and wet bulb were varied until the same feeling of warmth as in the first chamber was experienced. Several combinations of wet and dry bulb temperatures were found to give the same feeling of warmth.

In the first part of the experiment no air movement was caused in the second chamber, and thus the effect of air movement upon the sensation of warmth was not investigated. Experiments were then continued altering the dry and wet bulb and air movements in the second chamber until the sensation of warmth was equal to that in the first chamber, in which air was kept saturated at 70 deg. Fah., and there was no air movement. Thus the combinations of dry-bulb, wet-bulb, and air movement which equal the effective temperature of 70 deg. Fah. were obtained. Similar readings were made by varying the saturated temperature of the air in the first chamber and finding the required combinations of dry-bulb, wet-bulb, and air movement necessary in the second chamber to give equal feelings of warmth.

Two sets of figures were obtained (1) *for human beings at rest and stripped to the waist*, and (2) *for human beings at rest and normally clothed.* From the Effective Temperature Chart for *normally clothed human beings*, the following combinations of wet-bulb, and dry-bulb temperatures and air movements are considered equivalent and equal to an effective temperature of 66 deg. Fahr.

Dry Bulb.	Wet Bulb.	Air Movement ft. per minute.
66	66	Nil.
70	59	Nil.
70	63	120
73	60	130
80	53	400

A comfort zone was also determined, but in this experiment the observers did not change from room to room, but they remained in one chamber and varied the dry-bulb, wet-bulb and air movement (or the effective temperature), and at each variation recorded their comfort. They found that for American sedentary workers the comfort zone was from 63 to 71 deg. effective temperature.

If we were to assume that the comfort zone in Sydney is the same as in a large portion of the United States, then we would expect to have comfortable conditions at saturated temperatures from 63 deg. Fah. to 71 deg. Fah., when there is no air movement (*i.e.*, at effective temperatures of 63 deg. to 71 deg.), or at any of the numerous wet and dry bulb readings and air movements, which correspond to this range. The optimum effective temperature is placed by the American workers at 66 deg. A critical examination of our readings shows that our sensations of comfort or discomfort are not judged accurately by the effective temperature, excepting when the comfort was very good, *i.e.*, at votes 3·5 and greater. On the other hand, quite uncomfortable conditions would, if the effective temperature were taken as the criterion, be considered comfortable. We are of the opinion that the effective temperature chart does not show the value of small air movements in cooling the body. It appears to us that the zone bounded by the 0 and 100 feet air movement may be modified by the further work of these eminent authorities.

According to Yaglou*: "The comfort zone, on the normal effective temperature scale, applies to average American men and women living inside the broad geographical belt across the United States, in which central heating is a household necessity during about four to seven months of the year. So far as I know, it has never been advocated for climates, clothing, and heating standards like those of Great Britain, although Vernon attempts to show that it cannot be so applied. He offers this as a proof of the variability of the comfort zone, attributing the difference to acclimatization. That the British comfort zone is unquestionably lower than the American will be admitted by anyone who has lived in both countries. But Vernon does not recognise a very important reason for this variability—namely, the difference in the clothing, particularly the underclothing worn in the two countries. Here in the United States most men wear thin cotton underwear the year around. Often this underwear is sleeveless and cut short at the knees. Woollen underwear is worn but seldom, and as a general rule only by older men or by men who spend the greater part of the day out of doors. It is most uncomfortable and unnecessary in the average American home or office heated from 68 to 72 deg. Americans going to England in winter for the first time usually dress in their habitual clothing and suffer accordingly until they clothe themselves in the under and outer garments used by the British. Similarly, Britishers upon landing in America complain of overheated homes, but they obtain relief by adopting the thin cotton under garments usually worn by Americans."*

Leaving to the future the determination of the comfort zone in the Eastern Australian States, which have an English-like climate in Tasmania and reach to the tropics in Queensland, we must at the present time state that we cannot use the effective temperature charts of the American workers to determine comfort in our Sydney theatres.

C. South African Work.

Porter and Cluver† in 1921 carried out an investigation into the ventilation of South African theatres. Their observations were all taken between the months of March and July, and, consequently, the dry-bulb readings were comparatively low, the highest dry-bulb recorded being 76 deg. Fah., and only in this observation did the absolute humidity rise above 6 grains per cubic foot. They were thus unable to observe the effect of high absolute humidity on their feelings of comfort. The indoor temperatures ranged from 61 deg. Fah. to 76 deg. Fah., and the absolute humidities were nearly all between 4 and 6 grains.

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* Yaglou, C. P.—Effective Temperature *versus* Kata Thermometer: A reply to H. Vernon.—Journal of Industrial Hygiene. Vol. VIII., 1926, p.404.

† Porter, C. and Cluver, E, H. Report to Public Health and Works Committees on Ventilation of Theatres and Cinema Halls in Johannesburg (1921).

One of their main recommendations was that in South African theatres the dry Kata cooling power should be not less than 5. Their observations show that at temperatures over 70 deg. a dry Kata of 5 is satisfactory, but in order to obtain comfort at temperatures under 70 deg. Fah. a higher dry Kata than 5 would be required.

To indicate their feelings of comfort or discomfort they used Winslow's scale 1 = cold, 2 = cool, 3 = comfortable, 4 = warm, 5 = hot). Taking their votes of 2·75–3·25 as indicating comfortable sensations, they were comfortable on 26 occasions. Only on 3 out of these 26 times was the dry Kata less than 5, the average dry Kata of the 26 observations was 5·9 and the average dry Kata for each dry-bulb temperature recorded was as below :—

Dry Bulb.	Dry Kata.
61	5·8
63	7·2
64	6·3
65	6·4
66	6·1
67	5·6
68	5·4
69	4·8
70	5·4
71	5·7
76	5·4

If we consider that votes greater than 3·5 indicate uncomfortable conditions, they were uncomfortable on 21 occasions, and on 9 of these occasions the dry Kata was greater than 5, and the average of the 21 observations 4·9.

From our observations we recommend that in Sydney theatres the dry Kata should not be less than 6·1 at 61 deg. F. and not less than 4·8 at 70 deg. F. The above analysis of the South African data shows that they might have asked for a similar standard in South African theatres.

Porter and Cluver state that the carbon dioxide standard is quite unsatisfactory for South African theatres, pointing out that on many occasions they recorded comfortable conditions in a theatre that would be condemned on a carbon dioxide standard, but were satisfactory when judged by the Kata thermometer.

The carbon dioxide concentrations found in South African theatres were much higher than those found by us. They indicate that the air supply per person in the South African theatres was very small. A limitation of the carbon dioxide concentration is by itself unsatisfactory, and we recommend an air supply per person as a very necessary part of regulations governing theatre ventilation, to reduce the danger of respiratory microbic infection, and to control temperature and humidity.

SECTION IV.—DATA ON WHICH CONCLUSIONS ARE FOUNDED.

(a) *Tabulation and Diagramatic Representation of Data Collected.*

Appendix V.—The complete data as collected is presented in tabulated form in Appendix V. Covering a period of twelve months 226 distinct sets of readings were made, 197 at St. James and Her Majesty's Theatres, and 29 at other Sydney theatres. Of the 226 readings, 40 per cent. were uncomfortable, 44 per cent. comfortable, and 16 per cent. very comfortable. The data consists of outdoor and indoor observations of wet and dry bulb temperatures, wet and dry Kata thermometer cooling powers and the air movements computed from the dry Kata readings. In addition comfort votes were recorded with each set of indoor readings. Precaution was taken to see that observers became accustomed to the indoor conditions and record their votes at the same time and place at which the Kata thermometer were taken. When uncomfortable conditions were met with several votes were taken to note if the observer became acclimatised. The indoor readings were taken in the stalls, dress circle and gallery of the theatre. Carbon dioxide concentrations were also determined in all parts of the theatre when possible. Appendix V also contains the corresponding dew point, relative humidity, and effective temperature as determined from the observed data.

Appendix III.—A chart showing the indoor dry Kata and wet Kata readings, dew points, wet-bulb, and dry-bulb temperatures and the indoor absolute humidities and comfort votes is presented in Appendix III. The readings were taken at St. James and Her Majesty's Theatres from 28th April, 1926, to 22nd March, 1927. These readings are given in Appendix V (numbers 1–197). This chart forms a convenient method of studying monthly variations of conditions. The factors anticipated as being of prime importance in the final analysis of the data are shown in a convenient form in Appendix IV. Using the dry-bulb and comfort votes as arguments, the corresponding air movements, absolute humidities, and difference between indoor and outdoor temperatures recorded are tabulated.

(*b*) *Analysis of Data collected.*

1. *Establishing the value of the comfort votes in correlating the data.*—A consideration of the data in Appendix IV shows that the difference between the indoor and outdoor dry-bulb temperature, other physical conditions being equal, has no influence on the comfort vote. The following examples illustrate this :—

TABLE I.

Dry Bulb.	Absolute Humidity Grains.	Air Movement.	Difference between Indoor and Outdoor Temperature.	Comfort Vote.
Deg. F.	Grains c. ft.	ft. per min.	Deg. F.	
76	6·7	94	4	3·5
	6·8	83	7	
74	5·0	30	6	3·5
	5·0	27	12	
73	4·7	30	2	3·5
	4·4	28	11	
74	7·2	39	6	3·0
	7·2	36	2	
71	5·7	29	8	2·5
	5·3	25	15	

Hence, in considering the data, we can exclude the difference between indoor and outdoor temperatures as a factor when comparing various conditions.

2. *Equal Physical Conditions found to give equal Comfort Votes irrespective of the Theatre.*—Readings from each theatre in which the dry-bulb temperatures and the comfort votes were equal and the absolute humidities were similar are presented in the following table with the air movements observed :—

TABLE II.

Theatre.	Dry-bulb Temperature.	Absolute Humidity.	Air Movement.	Comfort Vote.
	Deg. F.	Grains c. ft.	ft. per min.	
Her Majesty's	72	5·8	18	2·0
St. James	...	5·4	31	...
Her Majesty's	79	7·6	33	2·5
St. James	...	7·3	55	...
St. James	...	8·0	55	...
Her Majesty's	78	5·8	32	2·5
St. James	...	5·5	51	...
St. James	...	5·1	27	...
Her Majesty's	72	5·2	35	2·5
St. James	...	5·2	32	...
Her Majesty's	80	7·5	38	2·75
Her Majesty's	...	7·5	34	...
St. James	...	7·3	37	...
Her Majesty's	75	5·9	27	3·0
St. James	...	5·5	27	...
Her Majesty's	69	4·6	18	3·0
St. James	...	4·4	12	...
Her Majesty's	75	5·1	54	3·25
St. James	...	5·5	55	...
Her Majesty's	71	4·0	29	3·5
St. James	...	3·7	12	...
Her Majesty's	68	3·9	15	4·0
St. James	...	3·8	35	...

Except in the case of comfort votes below 3·0, there is a general agreement in the voting system, showing that equal comfort votes have been assigned to similar physical conditions, irrespective of the theatre in which they were made. Hence, when the comfort votes have been from 3·0 to 3·5, the readings at both theatres are equally reliable when considering the factors producing comfort. As our comfort curves have been based on readings for which the comfort votes were 3·0 to 3·5, we have thus been able to use the observations in both theatres to obtain them. That is to say, the same comfort curve applies to both theatres.

An analysis of the readings taken in other Sydney theatres (Nos. 198 to 226) shows that they conform to the curves obtained from Her Majesty's and St. James readings. Therefore, results obtained from our investigations are applicable to all Sydney theatres.

3. *Plotting the Comfort Curves*:—We have plotted curves showing the air movement required at different dry-bulb temperatures and absolute humidities to produce conditions of comfort judged by us as being from 3·0 to 3·5 on the comfort scale (Appendix 1A).

The dry-bulb temperatures were plotted as ordinates and the air movements in feet per minute as abscissae for all observations where the absolute humidity was between 4 and 6 grains per cubic foot and the comfort vote from 3·0 to 3·5 inclusive. Observed points are shown thus ○, and means of these points for each temperature are shown thus ●. Absolute humidities between 4 and 6 grains per cubic foot were selected because the absolute humidities recorded (see Appendix III) have a mean value of about 5 grains per cubic foot. Comfort votes from 3·0 to 3·5 were selected because our experience was that they represented the zone of comfort as judged by us.

The points thus plotted lie in an area bounded by two smooth curves which can be regarded as the comfort zone for absolute humidities between 4 and 6 grains per cubic foot (between dew points of 50 and 61 degrees F.). A curve through the centre of this area was taken as representing the air movements required at various temperatures for an absolute humidity of 5 grains per cubic foot and the upper and lower limits of the zone as being curves for absolute humidities of 4 and 6 grains per cubic foot respectively.

If the readings when the absolute humidities of 4, 5 and 6 grains respectively are plotted separately instead of collectively as we have done, it is found that those in each group, while they lie within the zone, do not necessarily lie along the separate curves as determined in the above manner. The reason for this is that (1) between the temperatures over which our readings were taken, variations of the absolute humidities from 4 to 6 grains only require comparatively small increases in air movement to produce comfort. (2) The comfort votes are not all equal, but vary from 3·0 to 3·5, and for this reason can only be used to plot a zone and not a comfort line. Otherwise one would expect the readings when the absolute humidity was 4 grains to crowd to the upper limit of the zone and when 6 grains to the lower limit.

However, to produce conditions of comfort with absolute humidities above 6 grains per cubic foot there is an unmistakable tendency, with very few exceptions, for high absolute humidities to be associated with high-air movements. At low absolute humidities, that is below 5 grains per cubic foot, even with high dry-bulb temperatures, we find that we recorded comfort votes of 3·0, and better even with extremely low air movements. The following table will stress these two points:—

TABLE III.

Temperature.	Absolute Humidity.	Air Movement Recorded.	Comfort Vote.
Deg. F.	Grains per c. ft.	ft. per min.	
81	3·9	24	3·0
80	8·0	124	3·5
79	3·6	23	3·25
79	7·3	79	3·25
79	8·0	76	3·0
76	3·0	40	3·0
76	3·3	49	3·5
76	8·0	133	3·5

Hence we feel we are entitled to select the upper limit of the zone as the smaller or 4-grain line, and the lower limit as the greater or 6-grain line.

Observations with absolute humidities of 7 and 8 grains were fewer than for 4 to 6 grains, but we found their corresponding positions by plotting readings in which the vote was 3·0 to 3·5, and also by using readings in which the vote was greater than 3·5 and less than 3·0 as a guide. The 7 and 8 grain lines are shown in Appendix I (*a*).

The experimental limits of the curves plotted from the data are between temperatures of 60 and 80 degrees F., and absolute humidities of 4 and 8 grains per cubic foot. It will be seen that the curves have been extended to temperatures of 85 degrees F. These higher points have been determined by the use of equations which were found to represent the portions determined experimentally, and are probably trustworthy for casts of the air movements required at these higher temperatures.

The equations of these comfort curves are:—

When the absolute humidity is grain per c. ft.	
4	$T - 60 = 10 \log 2 (a - 7)$.
5	$T - 60 = 9{\cdot}5 \log 2 (a - 15)$.
6	$T - 60 = 9 \log 2 (a - 25)$.
7	$T - 60 = 9 \log 2 (a - 33)$.
8	$T - 60 = 9 \log 2 (a - 42)$.

Where T is dry-bulb temperature in degrees F., and
a is air movement in feet per minute.

In Appendix I (*b*) the comfort curves are arranged to show the air movement necessary to provide comfort at different combinations of wet and dry bulb temperatures.

These curves were plotted by using points derived from the curves of Appendix I (*a*).

In Appendix II the curve shows the dry Kata cooling power required to produce comfort at an absolute humidity of 5 grains per cubic foot for temperatures between 60 and 80 degrees F.

This curve is plotted directly from the 5 grain comfort curve shown in Appendix I (*a*). The dry Katas observed when the comfort vote was from 3·0 to 3·5 and the absolute humidity from 4 to 6 grains per cubic foot are shown ○, and the means of these observed dry Katas for each temperature are shown ●. Sixty-five observations were made satisfying the above conditions as to votes recorded and humidities. The winter readings were nearly all below and the summer readings practically all above 73 degrees dry-bulb, so the direct comparison of the dry Kata standard required for winter and summer cannot be made very conclusively. However, a comparison made by using all observations recorded points to the fact that there is little difference between the dry Kata required in winter and that required in summer.

Attention is drawn to the change of the shape of the curve at 74 degrees dry-bulb. This corresponds to a wet-bulb reading of 63 degrees. In applying a dry Kata standard a series of curves would have to be drawn for each absolute humidity, but as the mean absolute humidity in Sydney theatres is about 5 grains per cubic foot, the 5 grain curve only has been plotted.

SECTION V.—CARBON DIOXIDE CONCENTRATION IN THEATRES INVESTIGATED.

A. Methods of Determination.

The following methods were employed at various times to determine the carbon dioxide concentration:—

(1) By means of Haldane's apparatus (for description, see first report, Ventilation of Factories and Workshops, 1902, Appendix 3, page 117).

(2) By collection in 100 c.c. flasks and analysing on the spot, using standard solution of sodium carbonate with pheonphthalein as an indicator.

"The estimation of carbon dioxide in the air—a simple and expeditious method."—W. M. Doherty, F.I.C., F.C.S., Govt. Lab., Sydney, N.S.W. Aust. Assoc. for the Advancement of Science, vol. 14, 1913. See Appendix VI, this report.

(3) By collection in Winchester bottles and subsequent analysis in the laboratory. As shown in Table IV, each method in competent hands is equally reliable. When using the Haldane apparatus or 100 c.c. flasks several outdoor samples were always analysed to ensure that the apparatus was working satisfactorily.

B.—Comparative Table showing Carbon Dioxide concentrations of Air Samples collected simultaneously and determined by different Methods.

TABLE IV.

Date.	Where taken.	Carbon Dioxide in parts per 10,000.		
		Haldane Apparatus.	Analysis by Doherty's method.	Laboratory Analysis.
1927.	St. James Theatre—			
20 Jan.	Gallery	9	9	...
		7	...	...
	Exhaust chamber	6	7	...
		4·5	...	...
		6	...	...
	St. James Theatre—			
10 Feb.	Dress Circle	5	5	...
		4	...	...
		5	...	...
		4	...	...
	Gallery	5	6	...
	St. James Theatre—			
22 Feb.	Dress Circle	...	6	5·4
		...	6	...
		...	6	...
	Her Majesty's—			
20 Jan.	Stalls	16	15	...
		12	...	...
		11	...	...
	Dress Circle	8	9	...
		8	...	...
	Her Majesty's—			
3 Feb.	Stalls	11	11·5	10·3
		10	...	...
		10	...	...
	Her Majesty's—			
8 Feb.	Stalls	7	9·5	9·0
		10	...	...
		6	...	...
	Dress Circle	10	10·0	9·2
		10	...	...
	Her Majesty's—			
24 Feb	Stalls	8·5	...	13·3
		13	...	...
		10	...	...
	Her Majesty's—			
3 Mar.	Stalls	11	...	12·2
		9	...	...
		9	...	...

It must not be assumed that the average carbon dioxide concentrations in Table V were derived from those in the above Table IV, it is pointed out that in addition to the above readings others were taken on the same evenings. These additional readings together with the above readings gave the average concentrations used in Table V. The above determinations were selected because the samples were collected simultaneously.

C.—Places where Samples were obtained.

At St. James Theatre the air samples were taken both in the theatre and in the exhaust chamber (for description of exhaust chamber, see under heading of "Systems of Ventilation"). Except where short circuiting occurred in the system (due to the opening of the main entry doors) the air in this chamber was a mixture of the air from all parts of the theatre, and its carbon dioxide content was thus a most reliable figure for computing the air change. The samples taken in the theatre were usually procured in the passage behind the last row of seats, although occasionally, when circumstances permitted, samples were taken about half-way down the aisles.

It is interesting to note, however, that the average of all the readings taken in the various parts of the theatre (stalls, dress circle and gallery) was in close agreement with those taken in the exhaust chamber. This is of importance in that we can regard the average carbon dioxide content of three samples taken at the back of the stalls, dress circle and gallery respectively (where they can be obtained with the least inconvenience to the audience) as being an index of the average carbon dioxide concentration of the air of the theatre.

At Her Majesty's Theatre all of the air samples were taken at the back of the stalls, dress circle and gallery.

*D.—Determination of the Number of Changes per hour of the Air in the Theatre.**

The left hand section of Table V shows the exhaust rate of the mechanical plant in St. James Theatre as determined from anemometer readings taken across sections of the fan cubicles, from which the air change per hour of the theatre has been computed. This air change is compared with that calculated from the knowledge of the attendance, the volume of the theatre and the carbon dioxide concentration. The agreement between the two methods of estimating the air change supports the statement that the average carbon dioxide content of the sample taken at the back of the stalls, dress circle and gallery is a reliable figure for computing the air change induced in the theatre.

In Her Majesty's Theatre where anemometer readings could not be obtained across the fan discharge the air changes have been calculated from the knowledge of the attendance, volume of the theatre and carbon dioxide concentration.

The low air change at Her Majesty's Theatre (averaging about 6½ changes per hour) is noticeably small when compared with St. James Theatre. The plant at the latter theatre was designed to supply 60 cubic feet per minute per person or 24 changes per hour.

E.—Relation between the Air Supply per Person, Air Movement and Comfort.

A consideration of the data given in the right-hand portion of Table V shows that the air supply per person, or the specific carbon dioxide concentration, has no apparent influence on the comfort as judged by us. The table indicates that air movement and not air change is the controlling factor. Similar conclusions are given in the report on the "Ventilation of Theatres and Cinema Halls in Johannesburg," the authors concluding that "In South Africa, at any rate, a carbon dioxide standard is entirely unsatisfactory."

F.—Temperature Rise and Air Supply.

Analysing the air supply and temperature data of the same table we find that an average air supply of 190 cubic feet per minute per person is required to limit the increase of the inside over the outside dry bulb temperature to 1 deg. F.

This figure indicates that an air supply of $\frac{190}{5}$ or 38 cubic feet per minute per person is required to limit the temperature rise to 5 deg. F. On the basis of 150 cubic feet of space per person this represents 14 air changes per hour, and a carbon dioxide concentration of six parts per ten thousand.

SECTION VI.—DESCRIPTION OF SYSTEMS OF VENTILATION IN ST. JAMES AND HER MAJESTY'S THEATRES.

St. James Theatre.

A mechanical extraction plant has been installed at this theatre, designed to exhaust 60 cubic feet per minute per person. The seating capacity of the theatre is 1,649 persons, and the net volume of the theatre 250,000 cubic feet.

The fresh air enters the theatre through a vertical duct at the back of the stage and through grille work in the ceiling above each of the proscenium boxes. The extraction grids are situated over practically the whole area of the wall at the back of the stalls, dress circle and gallery. The air thus moves "en masse" from the front to the back of the theatre.

The *inlets* at the back of the stage extend for the full stage width and enter the theatre at stage level and are only effective when the front curtain is raised. The inlet through the grille work of the ceiling near the proscenium is not affected by the position of the front curtain. The air entering the theatre is not treated in any way.

The *extraction* grids extending across the back walls are openings into large vertical ducts which discharge into a common chamber above the theatre. It is in this chamber that the fans are situated and the air extracted from the theatre passes through them to the outside of the building.

There are three *extraction fans* which are of the low pressure propeller type. Each fan is housed in a cubicle and discharges through a louvred opening in the outside wall of the exhaust chamber. Each of the cubicles is provided with a pair of doors which can be closed when the fan in the cubicles is not in operation. This prevents the discharge opening of the non-operative fan from acting as an air inlet to the operating limit. The starting and speed controls of the fans are operated from the stage of the theatre by the electrician.

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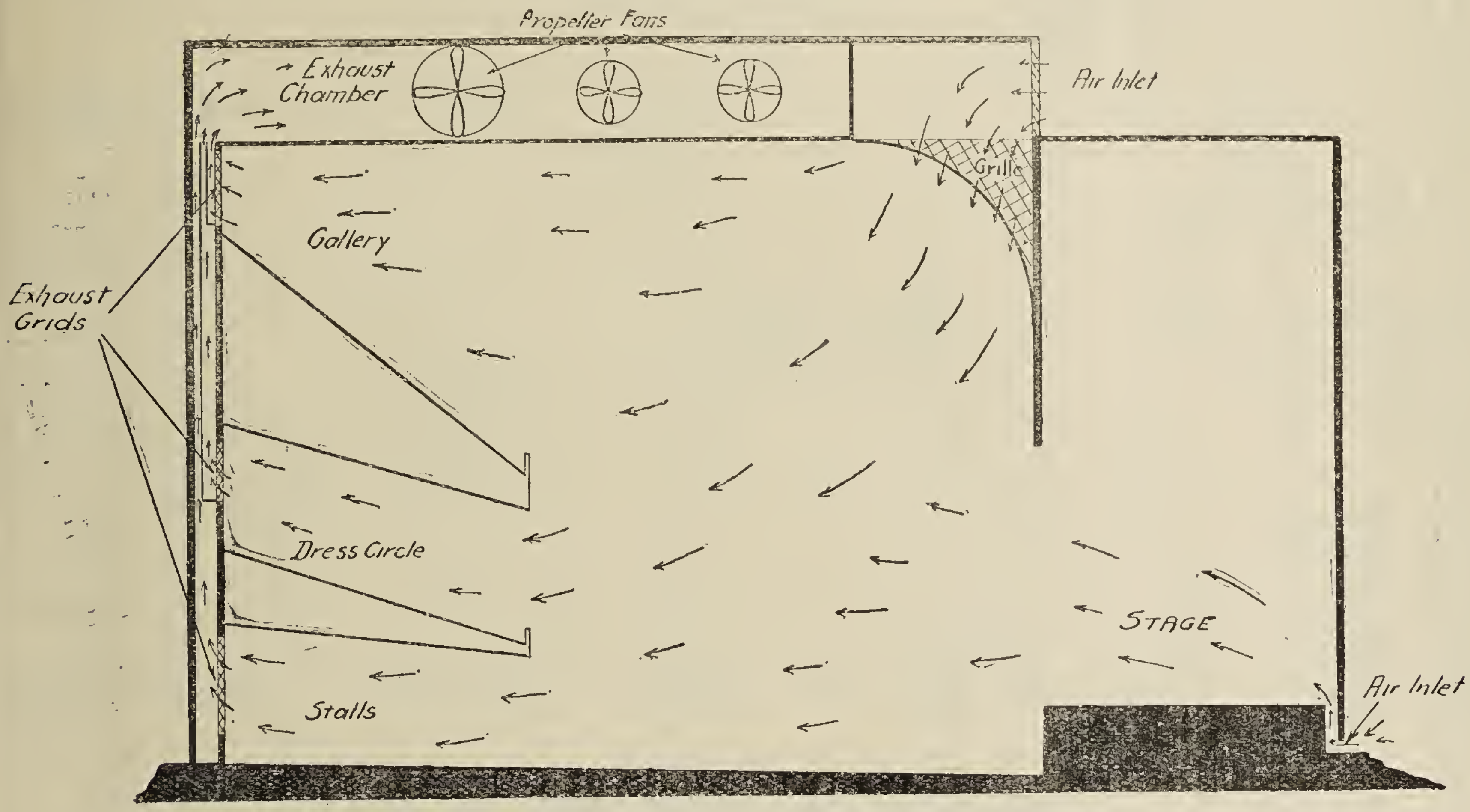
* NOTE.—In computing the air changes from the carbon dioxide readings, the concentration in the external air has been taken at three parts of carbon dioxide per ten thousand, which is an average figure for Sydney. The carbon dioxide emitted per hour has been taken as 0.6 c. ft. per person.

With an extraction system such as this any door-opening in the theatre communicating with the outside becomes an air inlet when the door is open. This became most noticeable when an entrance door to the theatre was opened. As these doors are situated in the wall at the back of the stalls, dress circle, and gallery respectively, and the extraction grids are along the same wall, the air entering through an open doorway is deflected to the adjacent grids. Large volumes of air can thus be taken into the theatre, but due to the short circuiting contribute little to the satisfactory ventilation of the theatre as a whole. These doors in the stalls and dress circle were never kept open permanently and care was taken in making the Kata thermometer observations that the instrument was at least 6 feet from the extraction grid and not subject to the effect of the opening of the doors. The same precautions were taken in the gallery where the entrance door was often kept open for the entire performance with an idea of churning up the air above the gallery. It will be seen from the accompanying sketch that an air stream through this doorway passes out over the heads of the audience and does not subject them to its full force.



— Diagram —
showing
Extraction System of Ventilation at St James Theatre, Sydney.

Her Majesty's Theatre.

A mechanical extraction plant has been installed at this theatre consisting of an extraction duct system leading to a centrifugal fan. No permanent inlets are provided for the incoming air which enters the theatre through doors, windows and chinks. A movable dome in the roof of the theatre can be slid aside exposing a circular opening of about 20 feet diameter.

The extraction ducts are housed in the hollow floor beneath the dress circle and gallery, and in the space above the ceiling of the gallery, and terminate at extracting grids above the stalls, dress circle and gallery respectively.

Ceiling fans suspended above the gallery, dress circle and the portion of the stalls below the dress circle induce local air movement.

It was only on three occasions when the observations were made that the entry doors were kept open. Windows in the gallery were frequently opened, and the dome was occasionally slid off.

A sensation of stuffiness was frequently observed on entering the theatre.

The air changes in this theatre are noticeably small when compared with St. James Theatre.

The seating capacity of the theatre was 1,517 people, and the net volume of the theatre 218,000 cubic feet.

A close examination of our results (Appendix 4) will show the value of a particular type of exhaust system in obtaining air movement in all parts of the theatre and in the production of comfort.

In St. James Theatre, where this exhaust system was practically always in use, 77 per cent. of the observations were comfortable, and 80 per cent. of the uncomfortable conditions were below 75 deg. F. On many of these latter occasions the exhaust system was either not operating at all, or running at a low rate.

At Her Majesty's Theatre, the ventilating machinery was quite inefficient, and only 36 per cent of the observations were comfortable. The average air movement at St James Theatre was 41 feet per minute and was procured solely by an exhaust system. Three ceiling fans were installed in each section of Her Majesty's Theatre to aid in the production of air movement, but the average air movement in this theatre was only 26 feet per minute, which shows either the inefficiency or the intermittent use of the fans.

TABLE V.—Showing the ventilation of two Sydney theatres, with details of attendance, exhaust rate of ventilating machinery, carbon dioxide readings, air changes per hour, (computed both from exhaust rate and carbon dioxide readings), air supply per person (computed from carbon dioxide readings), comfort votes, outside temperatures, temperatures and absolute humidities in theatre, average air movements recorded in all parts of theatre, air movements required by our standards to give comfort, St. James and Her Majesty's Theatres, Sydney.

Date.	Exhaust rate of fans, cubic feet per minute.	Attendance, plus 100 for stage personnel.	CO_2 readings in parts per 10,000.	Air changes per hour, computed from— Exhaust rate.	Air changes per hour, computed from— CO_2 reading.	Remarks.	Cubic feet per person per hour based on CO_2 readings.	Cubic feet per person per minute.	Average comfort vote in stalls, gallery, and circle.	Temperatures in deg. F. Outside.	Temperatures in deg. F. In theatre. Abs. H. grains per cubic feet.	Temperatures in deg. F. In theatre. Temperature.	Average of air movements recorded in all parts of theatre.	Air movement required.	Remarks.
						St. James Theatre (volume, 250,000 cubic feet).					Averages of readings taken in theatre.				
5/5/26	50,500	1,600	6·2	12·0	12·0	CO_2 readings in exhaust chamber.	1,870	31	3·25	62	5·8	71	12	32	Air supply figure is reliable.
12/5/26	53,000	1,697	5·9	13·0	14·0	,, ,,	2,060	34	3·5	56	4·2	69	28	12	,, ,,
30/6/26	26,500	1,380	5·5	6·5	13·0	,, ,, There appears to be short circuiting, thus giving low CO_2 reading in chamber.	*1,620	27	2·5	51	4·2	68	24	12	*Air supply figure computed from fan reading. Actually less than this, due to short circuiting.
7/7/26	Nil.	1,377	14	...	3·0	CO_2 reading is mean of readings taken in theatre and in chamber. *Exhaust fans not running*:—Eleven parts in theatre; sixteen parts in chamber.	545	9	2·25	54	5·4	70	29	26	Air supply figure is reliable.
19/8/26	37,200	1,554	8	9	8	CO_2 reading is mean of readings taken in theatre and in chamber.	1,280	21	3·5	65	4·1	72	48	15	,, ,,
9/9/26	33,000	1,564	8	8	8	CO_2 readings taken in theatre. CO_2 dropped from seventeen to eight parts when fan had been running for half hour.	1,280	21	3·25	61	5·3	72	29	27	,, ,,
7/10/26	Nil.	1,216	11	...	4	CO_2 reading is mean of readings taken in theatre and in chamber (practically equal). *Exhaust fans not running*:—Eleven parts in theatre; ten parts in chamber.	820	14	3·0	60	4·1	74	25	22	,, ,,
4/11/26	15,000	1,090	10	4	4	CO_2 reading in exhaust chamber.	920	15	3·5	63	3·0	75	36	13	,, ,,
20/1/27	105,600	1,544	7	25	9	CO_2 reading is mean of readings in theatre. CO_2 was five parts in chamber, indicating short circuiting.	1,450	24	3·0	72	7·2	77	61	71	,, ,,
1/2/27	53,550	1,005	5	13	12	CO_2 reading is mean of readings taken in theatre and in chamber (practically equal). (Five parts in theatre, four parts in chamber.)	3,000	50	2·5	73	7·4	78	40	88	,, ,,
3/2/27	84,250	1,066	6	20	9	CO_2 reading is mean of readings in theatre. CO_2 was four parts in chamber, indicating short circuiting which was known to be caused by the door being open in the gallery.	2,100	35	3·0	79	3·6	81	67	60	,, ,,
10/2/27	111,000	1,034	5	27	12	,, ,, ,,	2,900	48	3·50	71	5·8	75	55	48	,, ,,
22/2/27	106,400	986	6	25	8	CO_2 reading is mean of readings in theatre; indicates short circuiting.	2,000	33	3·5	67	5·8	73	61	39	,, ,,
24/2/27	110,000	1,130	5	26	14	,, ,, ,,	3,100	52	...	72	...	...	...	...	,, ,,
1/3/27	70,000	741	6	17	6	CO_2 reading is mean of readings in theatre. Indicates short circuiting, caused by opening of door in gallery.	2,000	33	3·5	75	7·0	76	60	65	,, ,,
17/3/27	59,500	1,226	5	14	15	CO_2 reading is mean of readings in theatre. Door in gallery closed.	3,100	52	3·0	74	8·3	78	77	93	,, ,,
						Her Majesty's Theatre (net volume, 218,000 cubic feet).									
30/6/26	Fan not accessible for anemometer reading.	1,617	12	...	5	Exhaust fans *not* working.	670	11	3·0	51	4·6	66	18	13	,, ,,
18/11/26		1,617	9	...	7		940	16	3·0	...	...	...	...	...	,, ,,
13/1/27		1,617	12	...	5	Exhaust fan running.	670	11	2·25	70	6·6	80	30	110	,, ,,
20/1/27		1,617	10	...	6		810	14	2·5	72	7·3	79	27	100	,, ,,
1/2/27		1,269	8	...	7	Exhaust fan running.	1,200	20	2·75	73	7·3	78	54	80	,, ,,
3/2/27		1,532	8	...	8	,, ,,	1,140	19	2·75	79	4·3	81	38	65	,, ,,
8/2/27		1,412	10	...	4	,, ,,	620	10	2·0	67	5·7	78	17	73	,, ,,
24/2/27		1,525	9	...	7	Exhaust fan *not* running.	1,000	17	2·5	72	7·6	80	28	120	,, ,,
3/3/27		1,328	7	...	9	,, ,,	1,460	24	2·5	77	7·7	80	43	120	,, ,,
10/3/27		1,133	9	...	5	,, ,,	960	16	2·5	71	6·3	76	18	54	,, ,,
22/3/27		685	7	...	8	,, ,,	2,550	43	3·25	68	5·0	75	42	34	,, ,,

SECTION VII.—RELATION BETWEEN THE AIR SUPPLY PER PERSON AND THE BACTERIAL CONTENT OF THE AIR OF THE THEATRES.

The results from exposure of petri dishes are presented in Table VI.

Excluding readings Nos. 1 to 9, which are not quite comparable with those taken at Her Majesty's Theatre, and considering readings 10 to 31, there appears to be an indication that the bacterial content of the air of St. James Theatre is lower than that of Her Majesty's Theatre. Whether this is due to the greater air supply per person at St. James Theatre or to the fact that Her Majesty's Theatre is an older building, it would be difficult to say.

Many more readings would have to be made to gain any useful knowledge of the bacterial content of the air of these theatres.

TABLE VI.—Showing the bacterial content of the air at St. James and Her Majesty's Theatres, as determined by the Petri Dish Method.

Date.	Petri Dish No.	Where Exposed.	Exposure Interval p.m.	Colonies.			Temperatures		Abs. H.	Attendance.	Air Supply per person.	Remarks.
				Total.	Computed for 10 min. exposure.	Remarks.	Dry Bulb.	Wet Bulb.				
		St. James Theatre.										
9-6-26	1	In exhaust chamber normal to air stream from exhaust ducts.	8·28-29 ...	20	200	Lemon yellow colonies (*Spirillum*). Moulds (*Penicillium glaucum*). Few sporing bacilli (*B. Subtilis*).		...	...	...	...	Velocity of air impinging on dishes was 140 ft. per min.
	2		8·31-39 ...	50	100							
	3	,, ,, ...	8·56-9·06	60	60	Few yeast and other ...						
30-6-26	4	,, ,, ...	9·50-51 ...	16	160	Moulds, chromogenic and spores.	69·5	59	4·4	1,380	27	Velocity of air impinging on dishes was 240 ft. per min.
	5		9·50-55 ...	6	12							
	6		9·50-10·00	12	12							
9-9-26	7	Air from exhaust ducts allowed to pass over dishes.	8·38-45 ...	79	112	Moulds, chromogenic ...	70	63	5·5	1,564	21	
	8		8·38-9·00	32	15							
	9		8·38-9·20	114	27							
24-11-26	10	Back of stalls	9·17-27	6	6	....	71	60	4·2	1,283	Air supply per person not determined.	28 ft. per minute air movement.
	11			4	4							
	12	Back of circle	9·33-43	7	7	....	73	62	4·7	...		27 ft. per minute air movement.
	13			9	9							
	14	Back of gallery	9·45-55	21	21	....	77	65	5·2	...		27 ft. per minute air movement.
	15			20	20							
8-12-26	16	Back of stalls	9·40-50	9	9	Chromogenic and moulds	75	65	5·4	940		55 ft. per minute air movement.
	17			10	10		75	65				
	18	Back of circle	9·55-10·05	10	10		77·5	66·5	5·7	...		51 ft. per minute air movement.
	19			25	25		77·5	66·5				
	20	Back of gallery	10·12-10·20	5	6		77	67	5·9	...		43 ft. per minute air movement.
	21			15	23		77	67				
		Her Majesty's Threatre.										
2-12-26	22	Back of circle	8·25-35	66	66	Mostly chromogenic and moulds.	73	65	5·7	1,617		27 ft. per minute air movement.
	23			94	94		73	65				
	24		8·45-55	40	40		74	65	5·5			
	25			42	42		74	65				
16-12-26	26	Back of circle	8·18-28	36	36	Chromogenic colonies and moulds.	73	65	5·7	1,617		No Kata reading.
	27			42	42		73	65				
	28		8·50-9·00	19	19		73	65	5·7	...		
	29			18	18		73	65				
	30		9·20-30	17	17		76	67·5	6·2	...		
	31			13	13		76	67·5				

SUMMARY.

1. An investigation has been made into the conditions of ventilation in certain Sydney theatres and a study has been carried out over one year to determine conditions which promote comfort.

2. The detailed results of physical and chemical conditions of the air, and the estimations of comfort in two Sydney theatres—one with an efficient mechanical system of ventilation, and one with an inefficient system—have been given, and from an analysis of the data obtained the following recommendations have been made :—That there should be (*a*) An air movement depending on the dry bulb temperature and absolute humidity; (*b*) An air supply of 30 cubic feet per minute per person when the outside dry bulb temperature is above 65 deg. Fahr., 20 cubic feet per minute per person when the outside temperature is between 55 and 65 deg. Fahr., and 15 cubic feet per minute per person when the outside temperature is below 55 deg. Fahr. The reasons for these recommendations have been given and discussed.

3. Our equation for comfort in Sydney theatres when the absolute humidity is 5 grains per cubic foot is :—

$$(T-60) = 9{\cdot}5 \log_{10} 2\,(a-15).$$

Where T=dry bulb temperature in degrees Fahr.
a = air movement in feet per minute.

4. The importance of air movement in the production of comfort is emphasised. On no occasion did we feel comfortable when the air movement was too small to be measured by the Kata thermometer, yet with low absolute humidities or at low dry bulb temperatures low air movements were capable of producing comfort. In this respect our work differs from that of recent American authorities, who have not recorded the practical value for the production of comfort in the clothed body of air movements less than 100 feet per minute.

5. The results of our investigation are given in graphical form in Appendices IA, IB, and II. Appendix IA consists of a set of curves showing the air movements required for comfort at temperatures ranging from 60 deg. Fahr. to 80 deg. Fahr. for absolute humidities of 4, 5, 6, 7, and 8 grains of moisture per cubic foot. Appendix IB shows the air movement required for comfort at given wet and dry bulb readings. Appendix II shows the dry Kata cooling powers required to give comfort at dry bulb temperatures of 60 deg. Fahr. to 80 deg. Fahr., and an absolute humidity of 5 grains per cubic foot. At higher absolute humidities than 5, higher cooling powers would be required, and at lower absolute humidities lower cooling powers would produce comfortable conditions.

Sydney, September, 1927.

APPENDIX IV.—The data in this table (which is abstracted from Appendix V) is arranged under the horizontal heading of comfort votes from 1·0 to 4·25 according to Vernon's Scale, and under the vertical heading of dry-bulb temperature from 63° F. to 83° F. In this manner observed conditions (air movement, absolute humidity and difference between indoor and outdoor temperature) found at various dry-bulb temperatures and comfort votes are grouped in squares. The value of air movement, humidity and difference between indoor and outdoor temperature in the production of comfort or discomfort can be studied.

The comfort zone is enclosed by heavy lines, and it is mainly from these readings that the comfort curves in Appendices IA, IB, and II are plotted.

Readings taken at St. James Theatre have one dot, those at Her Majesty's two dots, and those at other theatres three dots placed after the temperature differences.

Comfort Votes.

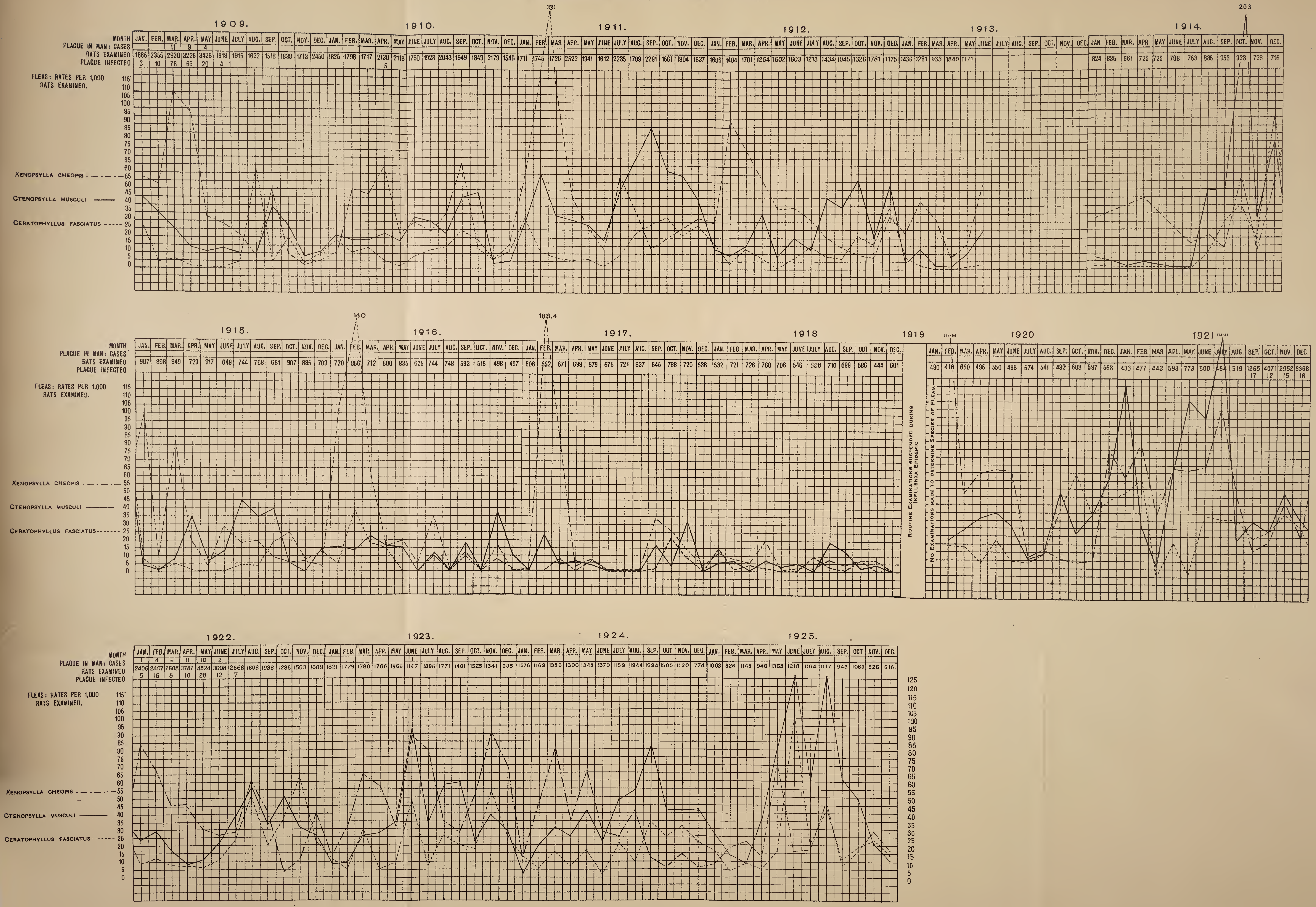
°F.	1·00			1·50			1·75			2·00			2·25		
	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absloute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.
	ft./min.	gr./c.ft.	°F.	ft./min.	gr./c.ft.	°F.	ft./min.	gr./c.ft.	°F.	ft./min.	gr./c.ft.	°F.	ft./min.	gr./c.ft.	°F.
83°	<8	8·0	0 ...							67 46	5·1 7·9	4·0 .. 11·0 ..			
82°				73	7·5	8·0 ..							23	8·1	5·0 ..
81°										25	7·0	11·0 ..			
80°										20 20	6·3 5·2	6·0 .. 6·5 ..			
79°										18 25	8·0 8·5	10·0 .. 4·0 ..	15 67	7·3 7·6	7·0 .. 6·0 ..
78°							<8	5·8	11·0 ..	17	6·6	4·0 ..	24 20	5·5 5·8	11·0 .. 11·0 ..
77°										<8	6·6	6·0 ..	30	4·5	17·0 .
76°													20	6·4	5·0 ..

°F.	2·50			2·75			3·00			3·25		
	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.
	ft./min.	gr./c.ft.	°F.	ft./min.	gr./c.ft.	°F.	ft./min.	gr./c.ft.	°F	ft./min.	gr./c.ft.	°F
83°	56 29	3·8 8·4	4·5 . 5·5 ...									
82°												
81°	35	7·8	9·0 ..	37	3·7	2·5 .	24	3·9	2·0 ..			
80°	57 29 44 31 37 77	8·7 8·7 6·3 5·2 6·7 6·8	5·0 .. 5·0 .. 12·0 .. 7·0 .. 10·0 .. —5·0 ...	37 34 38	7·3 7·5 7·5	8·0 . 8·0 .. 11·0 ..						
79°	55 55 33	8·0 7·3 7·6	5·0 . 5·5 . 2·0 ..				76	8·0	5·0 .	79 23	7·3 3·6	7·0 . 0·0 ..
78°	27 27 51 32 27	7·6 5·1 5·5 5·8 6·2	5·0 . 16·0 . 9·0 . 4·0 .. 8·0 ..	72 27	7·4 7·0	1·0 .. —7·5 ...				55 93	6·6 6·6	10·0 . 10·0 .
77°	16 21 20	7·4 7·4 6·8	8·0 .. 4·0 .. 5·0 ..				37 43 15 50 27 20	7·2 5·6 7·2 6·4 4·8 7·2	4·0 . 8·0 . 5·0 .. 9·0 .. 4·0 .. 2·0 ...	66 57 60 26	5·6 7·2 5·2 6·8	6·0 . 2·5 . 8·0 . 9·0 .
76°	33 16	4·3 4·9	16·0 . 3·0 ..				40 49 30	3·0 6·4 4·9	13·0 . 8·0 . 8·0 ..	47 42	6·8 5·4	1·5 . 7·0 .

°F.	3·50			3·75			4·00			4·25		
	Air Movement.	Absloute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.
	ft./min.	gr./c.ft.	°F	ft./min.	gr./c.ft.	°F	ft./min.	gr./c.ft.	°F	ft./min.	gr./c.ft.	°F
83°												
82°												
81°												
80°	107 124	3·3 8·2	1·5 . 5·0 .									
79°	46 37	7·8 7·6	0·5 ... 0·5 ...									
78°	57	8·2	3·0 .									
77°	73	7·2	4·0 ..	100 36 40	8·9 6·1 6·6	2·5 . 8·0 ... 1·5 ...						
76°	133 49 94 83 29 62	8·0 3·3 6·7 6·8 6·4 7·2	1·0 . 13·0 . 4·0 . 7·0 . 4·0 ... 1·0 ...	76	7·2	1·5 .	18	6·6	7·0 ...			

∠ Signifies less than;

Chart designed to show Seasonal Prevalence of the three principal species of Fleas found on Rats examined in the Microbiological Laboratory each year from 1909 to 1925 inclusive.



Lines not Completed for the Second Half-year, 1913.

Examination of Rats was suspended from July to December, 1913, owing to the Smallpox outbreak.

APPENDIX IB

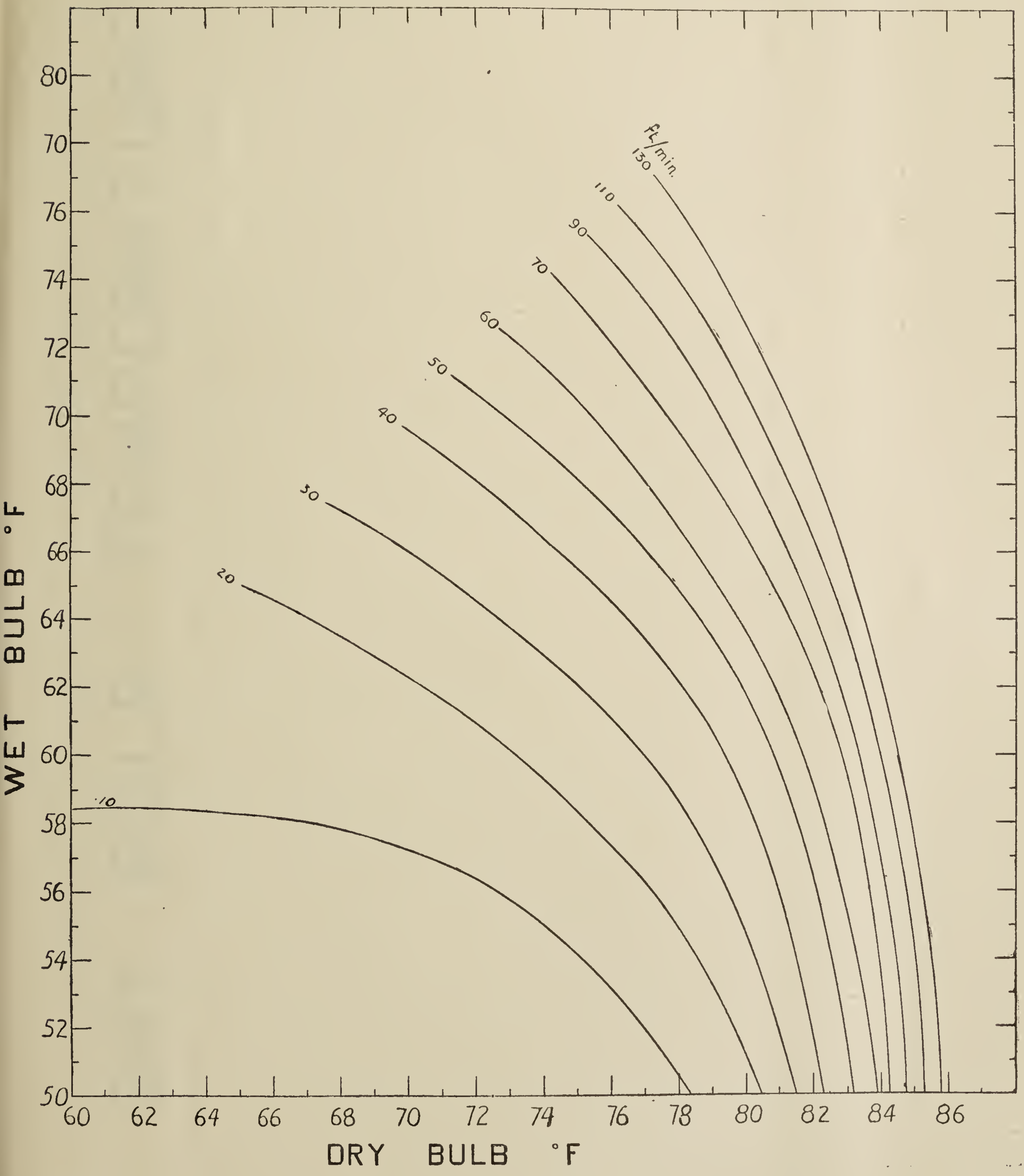
Curves showing air movements required by our formulae to produce comfort at different combinations of wet and dry bulb temperatures.

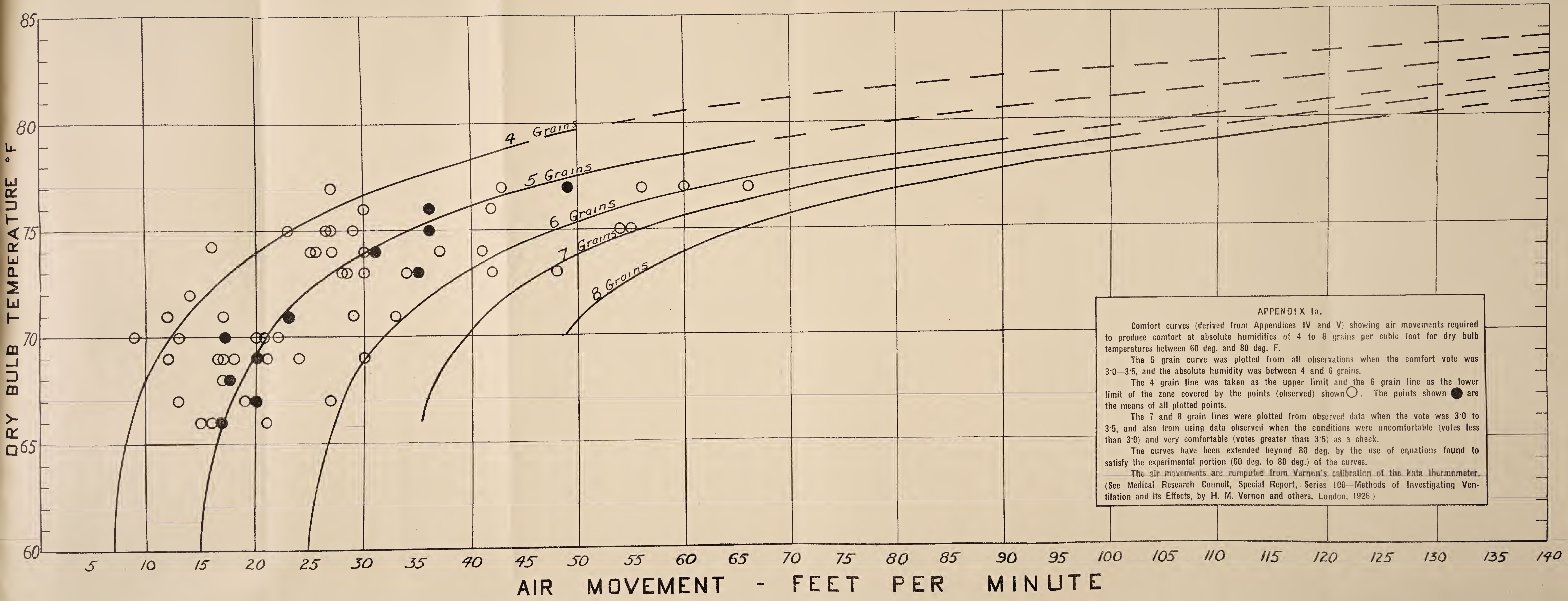
This graph was formed from Appendix IA, and the data observed when the vote was uncomfortable (less than 3·0) was used as a check.

The use of the chart is shown by the following examples :—

With a dry bulb 76 and wet bulb 60 the air movement required for comfort is 26 feet per minute.

With a dry bulb 76 and wet bulb 72 the air movement required for comfort is 70 feet per minute.





APPENDIX Ia.

Comfort curves (derived from Appendices IV and V) showing air movements required to produce comfort at absolute humidities of 4 to 8 grains per cubic foot for dry bulb temperatures between 60 deg. and 80 deg. F.

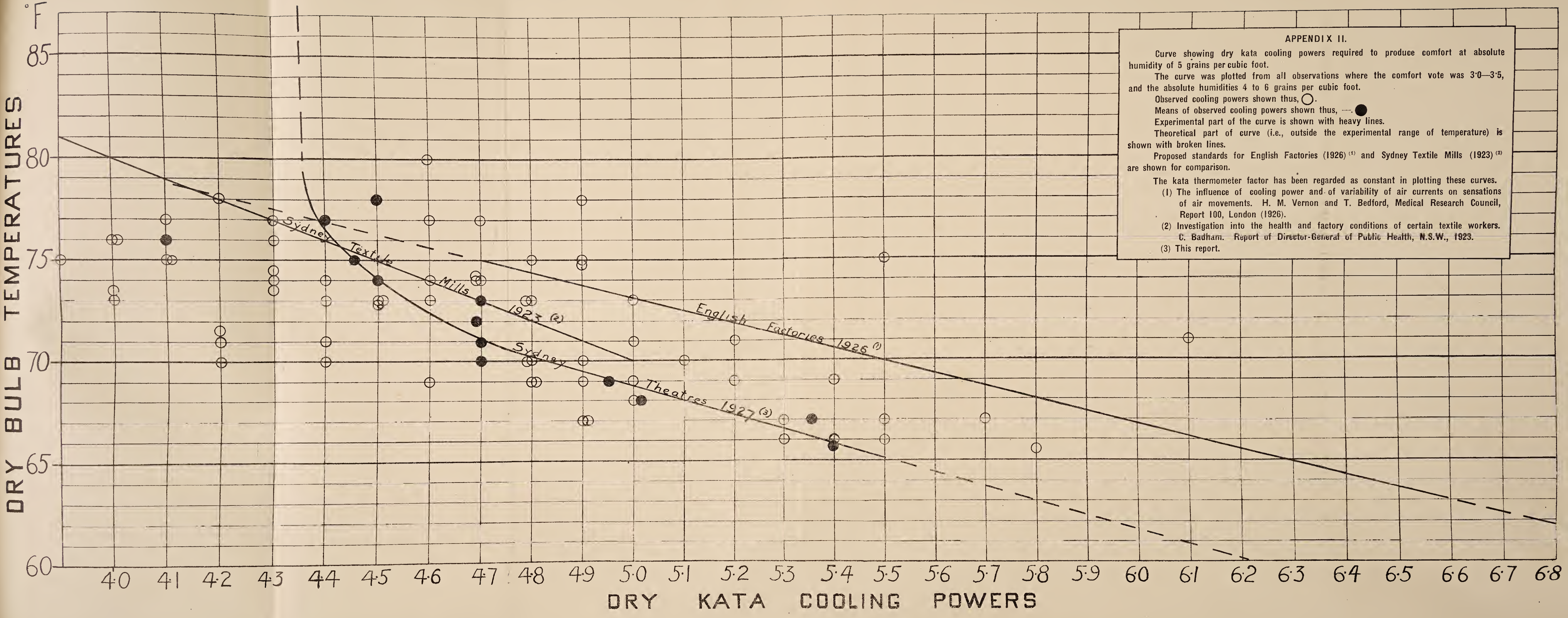
The 5 grain curve was plotted from all observations when the comfort vote was 3·0—3·5, and the absolute humidity was between 4 and 6 grains.

The 4 grain line was taken as the upper limit and the 6 grain line as the lower limit of the zone covered by the points (observed) shown ○. The points shown ● are the means of all plotted points.

The 7 and 8 grain lines were plotted from observed data when the vote was 3·0 to 3·5, and also from using data observed when the conditions were uncomfortable (votes less than 3·0) and very comfortable (votes greater than 3·5) as a check.

The curves have been extended beyond 80 deg. by the use of equations found to satisfy the experimental portion (60 deg. to 80 deg.) of the curves.

The air movements are computed from Vernon's calibration of the kata thermometer. (See Medical Research Council, Special Report, Series 100—Methods of Investigating Ventilation and its Effects, by H. M. Vernon and others, London, 1926.)



APPENDIX II.

Curve showing dry kata cooling powers required to produce comfort at absolute humidity of 5 grains per cubic foot.

The curve was plotted from all observations where the comfort vote was 3·0—3·5, and the absolute humidities 4 to 6 grains per cubic foot.

Observed cooling powers shown thus, ○.

Means of observed cooling powers shown thus, —. ●

Experimental part of the curve is shown with heavy lines.

Theoretical part of curve (i.e., outside the experimental range of temperature) is shown with broken lines.

Proposed standards for English Factories (1926) (1) and Sydney Textile Mills (1923) (2) are shown for comparison.

The kata thermometer factor has been regarded as constant in plotting these curves.

(1) The influence of cooling power and of variability of air currents on sensations of air movements. H. M. Vernon and T. Bedford, Medical Research Council, Report 100, London (1926).

(2) Investigation into the health and factory conditions of certain textile workers. C. Badham. Report of Director-General of Public Health, N.S.W., 1923.

(3) This report.

APPENDIX IV.—Comfort Votes.—*continued.*

	1·00			1·50			1·75			2·00			2·25		
	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.
75°															
74°													27	5·0	9·0 .
73°															
72°							24	5·8	12·5 ..	31 18 9	5·4 5·8 5·8	18·0 . 10·0 .. 4·5 ...			
71°										18	5·2	9·0 ..	16	5·3	9·0 ..
70°															
69°										<8 27 25	5·9 5·1 4·3	13·5 . 15·0 . 15·0 ..	17 30	4·9 4·0	15·0 . 15·0 ..
68°													<8 <8	4·1 4·1	5·0 .. 6·0 ...
67°															
66°															
65°															
64°															
63°															

	2·50			2·75			3·00			3·25		
	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.
75°	15	5·5	10·0 ...	15 33	5·3 4·4	7·0 . 9·0 .	27 48 27	5·5 6·6 5·9	8·0 . 7·0 . 7·0 ..	23 55 54	5·9 5·5 5·1	4·0 . 6·0 . 7·0 ..
74°	29 9 25	6·1 8·2 5·6	13·0 . 5·0 . 12 ..	20	4·3	14·0 .	16 39 36 10	5·4 7·2 7·2 6·8	5·5 . 6·0 . 2·0 . 2·0 ...	36 41 25	3·0 5·0 6·0	11·0 . 6·0 .. 3·0 ..
73°	22 18	6·5 6·1	11·0 .. 11·0 ..				48 42 28 28 26 15	4·1 5·4 5·0 4·8 5·6 5·1	7·0 . 12·0 . 8·0 . 6·0 ... 6·0 ... 8·0 ...	34	4·1	7·0 .
72°	32 35 21	5·2 5·2 4·2	11·0 . 16·0 .. 15·0 ..	44 20 16	5·2 5·2 4·5	18·0 . 11·0 . 9·0 ..	27	3·9	14·0 ..			
71°	29 34 25	5·7 4·7 5·3	8·5 . 14·0 . 15·0 ..				63 12	4·7 5·9	14·0 . 6·0 ..	36	3·7	5·0 .
70°	11 34	6·0 4·4	12·0 .. 17·0 ..	30	5·8	10·5 ..	9 20 13	5·8 5·5 4·1	8·5 . 9·0 . 13·0 ..	20	5·2	14·5 .
69°				26	4·0	15·0 ..	12 21 18	4·4 4·0 4·6	12·5 . 5·0 .. 12·0 ..	24	5·6	9·5 .
68°	31 <8 <8	4·2 5·2 6·5	17·0 . 3·0 .. 10·0 ..	20	5·4	14·0 .	17	3·8	10·0 ..			
67°							13	4·5	10·0 .	22	3·9	13·0 ..
66°	18	4·3	15·0 .				16	4·5	15·0 ..	19 21 24 24	3·7 4·7 3·4 3·8	12·0 .. 15·0 .. 12·0 .. 12·0 ..
65°	37	4·5	11·0 .									
64°												
63°												

	3·50			3·57			4·00			4·25		
	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Differences in temp. Inside—Outside.	Air Movement.	Absolute Humidity.	Difference in temp. Inside—Outside.
75°	29 34 51	4·9 2·8 6·0	6·5 . 12·0 . 6·0 ...	50	4·8	6·0 .	118 91	5·6 7·0	3·5 . 6·0 .			
74°	30 25 37 27	5·0 4·8 4·3 5·0	6·0 . 8·0 . 12·0 . 12·0 .									
73°	15 30 28	6·1 4·7 4·4	2·0 . 7·0 . 11·0 .	51 30	4·1 2·8	7·0 . 10·0 .						
72°	14 15	5·9 4·9	10·0 . 7·0 ...	38 70	3·8 3·8	6·0 ... 6·0 ...	94 53 34 18	6·6 4·2 4·6 5·2	5·0 . 10·0 . 10·0 . 0·0 ...	78	3·6	6·0 ...
71°	33 17 12 29	6·0 6·0 3·7 4·0	10·0 . 10·0 . 11·0 . 13·0 ..	63 84 20	5·2 3·7 5·3	4·0 . 5·0 . 10·0 .	23 27	4·7 5·0	5·0 . - 1·0 ...			
70°	22 26	3·9 4·4	10·0 . 8·0 ...	45	3·9	14·0 .	41 30	5·5 2·3	9·0 . 7·0 .			
69°	17 17 30	5·5 4·3 4·3	9·5 . 12·0 .. 16·0 ..	23	5·6	8·0 .						
68°	17	4·7	6·0 ..				15 35 35 15	5·2 5·1 3·8 3·9	10·0 . 2·0 . 8·0 . 10·0 ..			
67°	19 27	5·3 4·4	5·0 . 10·0 .	60	4·2	9·5 .	29 47	5·8 5·5	9·0 . 5·0 .			
66°	15	4·3	13·0 ..				30	4·7	10·5 .	38	5·7	5·0 .
65°												
64°												
63°							86	4·1	6·0 .			

< Signifies less than.

APPENDIX V.—Table showing all observations made of *outdoor* and *indoor* dry-bulb and wet-bulb temperatures, and dry kata and wet kata cooling powers, together with the calculated relative humidities, absolute humidities, dew points, and air movements. The table also includes for indoor conditions, effective temperatures, carbon dioxide determination in parts per 10,000, comfort votes recorded, attendances, and remarks as to ventilation.

Observations numbers 1 to 197 were taken at Her Majesty's and St. James' theatres at night, and numbers 198 to 226 at other Sydney theatres, and include day and night observations.

No.	Date and Time.	Outdoor Readings.						Theatre.	Place and Time.	Temperatures.						Dry Kata.	Wet Kata.	Air Movement, ft. per minute.	CO₂ parts per 10,000.	Comfort Vote.	Attendance.	Remarks.
		DryBulb, °F. (relative humidity).	Wet Bulb, °F. (absolute humidity).	Dew Point, °F.	Kata.		Air Movement, feet per minute.			Dry Bulb, °F.	Wet Bulb, °F.	Dew Point, °F.	Relative Humidity, per cent.	Absolute Humidity, grs. per c. ft.	Effective Temperature, °F.							
					Dry.	Wet.																
									St. James' and Her Majesty's Theatres. p.m.													
1	28–4–26	68	60	55	7·9	15·9	103	St. James ...	Stalls, 8.10	74	64	58	55	5·0	70	4·4	10·4	30	...	3·5	100%	One 9-ft. fan working at quarter speed.
2	7.50 p.m.	(60%)	*(4·5)						Circle, 8.40	73·5	64·5	59·5	60	5·4	70	4·0	9·5	16	...	3·0	85%	
3									,, 9·00	74·5	64	57·5	53	4·9	70	4·3	12·8	29	...	3·5	85%	
4									Gallery, 9·20	75	65	59	56	5·3	71	3·6	10·6	15	...	2·75	100%	
5	5–5–26	61·5	58	55·5	9·8	20·3	105	St. James ...	Stalls, 8·45	71·5	65	61·5	69	5·9	69	4·2	12·8	14	...	3·5	85%	One 9-ft. fan running at less than half-speed.
6	8.10 p.m.	(80%)	*(4·9)						Circle, 8.30	70	64·5	61	72	5·8	68	4·2	12·1	9	...	3·0	90%	
7	5–5–26	64·5	58	53·5	9·8	20·3	105	Her Majesty's	Stalls, 9·15	68	62	58	69	5·2	66	3·6	10·4	< 8	...	2·5	100%	Exhaust fan not running.
8	9.0 p.m.	(65%)	*(4·4)						Circle, 9.40	71	65	62	71	5·9	68·5	4·2	11·5	12	...	3·0	100%	
9	12–5–26	56	49	42	10·0	19·4	64	St. James ...	Stalls, 8.10	70	58·5	50	49	3·9	66	5·7	14·0	45	...	3·75	100%	Fan running at quarter-speed.
10	7.50 p.m.	(60%)	*(3·0)						Circle, 8.30	68·5	60	55	58	4·4	65·5	4·6	11·9	12	...	3·0	85%	
11	12–5–26	54	48	42	10·0	19·4	64	Her Majesty's	Stalls, 9·10	69	58	50	51	4·0	65·5	5·2	14·0	26	...	2·75	85%	Ceiling fans not working; exhaust fan not running.
12	9.40 p.m.	(64%)	*(3·0)						Circle, 9.45	66	56	48	53	3·7	63	5·5	13·1	19	...	3·25	100%	
13	20–5–26	59·5	51·5	44·5	10·0	15·9	84	Her Majesty's	Gallery, 8.25	70	64·5	61	72	5·8	67·5	5·2	12·0	30	...	2·75	100%	Fans running; all windows open; kata in stalls in line with doorway, which opened several times.
14	8.0 p.m.	(54%)	*(3.1)						Stalls, 8.45	72	65	61	67	5·8	69	4·6	11·4	24	...	1·75	100%	
15	20–5–26	59·5	51·5	44·5	10·0	15·9	84	St. James ...	Stalls, 9.15	69	63·5	60	72	5·6	67	5·2	13·5	24	...	3·25	95%	
16	8.0 p.m.	(54%)	*(3·1)						Circle, 9·40	69	63	59	70	5·5	67	4·8	11·8	17	...	3·5	...	
17	26–5–26	63	52	42	...	...	...	Her Majesty's	Stalls, 9·25	68	58	51	54	4·1	64·5	4·0	11·5	< 8	...	2·25	100%	Exhaust fan not running.
18		(46%)	*(3·0)						Circle, 9.45	72	61	54	53	4·5	68	4·2	12·1	16	...	2·75	100%	
19	2–6–26	61	59·5	59	11·6	18·2	169	St. James ...	Stalls, 8.30	71	65	62	72	6·0	68	5·2	11·8	33	...	3·5	70%	
20	8.0 p.m.	(92%)	*(5·5)						Circle, 8.40	71	65	62	72	6·0	68	4·4	10·9	17	...	3·5	50%	
21									Gallery, 8.55	73	66	62	69	6·1	...	...	...	...	...	2·0	100%	
22	2–6–26	62	60	59	11·6	18·2	169	Her Majesty's	Stalls, 9.55	73	67	64	73	6·5	70	4·3	11·8	22	...	2·5	90%	No fans running; dome closed.
23	9.40 p.m.	(89%)	*(5·5)						Circle, 10.10	73	66	62	69	6·1	70	4·2	10·0	18	...	2·5	90%	
24	9–6–26	58	55·5	54	8·8	20·3	49	St. James ...	Stalls, 8.15	67	63	61	79	5·8	65	5·8	12·4	29	...	4·0	75%	
25	8.0 p.m.	(85%)	*(4·6)						Circle, 8.30	68	62	58	69	5·2	65·5	4·9	12·1	15	...	4·0	20%	
26	9–6–26	58	55·5	54	8·8	20·3	49	Her Majesty's	Stalls, 8.45	68	65·5	64	86	6·5	67	4·0	7·4	< 8	...	2·5	100%	No fans running; dome closed.
27		(85%)	*(4·6)						Circle, 9.15	70	65	62	75	6·0	68	4·3	11·8	11	...	2·5	100%	
28	16–6–26	55·5	53	51	8·5	17·2	32	St. James ...	Stalls 8.20	66	59	54	66	4·7	63·5	6·1	11·2	30	...	4·0	80%	Ventilation plant not running.
29	8.0 p.m.	(85%)	*(4·2)						Circle, 8.35	70	62	57	64	5·2	67	4·8	12·8	20	...	3·25	50%	
30									Gallery, 8.50	69	64	61	76	5·9	67	4·0	9·5	< 8	...	2·0	100%	
31	16–6–26	...	...	...	...	...	...	Her Majesty's	Stalls, 9.30	72	63	58	61	5·2	68·5	5·0	...	35	...	2·5	100%	Readings in stalls unsatisfactory—door repeatedly opened; no fans running.
32									Circle, 9.55	71	63	58	64	5·3	68	4·8	...	25	...	2·5	100%	
33	21–6–26	62	59·5	58	10·8	22·3	149	St. James ...	Stalls, 8.20	67	62	59	75	5·5	64	6·6	16·0	47	...	4·0	65%	Ventilation plant not running; door open in gallery.
34	8.10 p.m.	(86%)	*(5·3)						Circle, 8.35	67	61·5	58	73	5·3	65	5·3	14·9	19	...	3·5	30%	
35									Gallery, 8.50	70·5	64	60	70	5·7	68	5·1	21·2	29	...	2·5	100%	
36	21–6–26	...	...	...	...	...	...	Her Majesty's	Stalls, 9.10	74	65·5	61	61	5·6	70·5	4·2	11·2	25	...	2·5	100%	
37									Circle, 9.30	72	65	61	67	5·8	69	4·3	10·9	18	...	2·0	100%	
38	23–6–26	61	58·5	57	10·6	21·2	130	St. James ...	Stalls, 8.10	66	62	60	80	5·7	64	6·4	16·0	38	...	4·25	60%	Ventilation plant not running.
39	7.45 p.m.	(86%)	*(5·2)						Circle, 8.30	69	63	59	72	5·6	66·5	5·1	13·5	23	...	3·75	50%	
40									Gallery, 9.30	74	66·5	62	67	6·1	71	4·4	13·1	29	...	2·5	100%	
41	30–6–26	51	48	45	12·6	32·5	97	Her Majesty's	Stalls, 8.15	65·5	59	54·5	68	4·7	63	5·8	14·2	21	10	3·25	100%	Very cold outside; raining; no fans running; dome closed.
42	8.0 p.m.	(81%)	*(3·5)						Circle, 8.35	66	58·5	53	64	4·5	63·5	5·4	13·8	16	14	3·0	100%	
43	30–6–26	51	48	45	12·6	32·5	97	St. James........	Stalls, 9.25	66	58	52	61	4·3	63	5·5	14·2	18	...	2·5	80%	Cold and raining; plant working; crowded house at matinee in afternoon; 100 per cent. attendance in gallery.
44	8,0 p.m.	(81%)	*(3·5)						Circle, 9.45	68	58·5	52	56	4·2	64·5	5·7	15·7	31	...	2·5	30%	

* Grains per cubic foot.

< Signifies less than.

No.	Date and Time.	Outdoor Readings.						Theatre.	Place and Time.	Temperatures.						Dry Kata.	Wet Kata.	Air Movement, ft. per minute.	CO_2 parts per 10,000.	Comfort Vote.	Attendance.	Remarks.
		Dry Bulb, °F. (relative humidity).	Wet Bulb, °F. (absolute humidity).	Dew Point, °F.	Kata. Dry.	Kata. Wet.	Air Movement, feet per minute.			Dry Bulb, °F.	Wet Bulb, °F.	Dew Point, °F.	Relative Humidity, per cent.	Absolute Humidity, grs. per c.ft.	Effective Temperature, °F.							
45	7–7–26	54	52	50	9·4	18·6	41	St. James ...	p.m. Stalls, 8.15	65	58	53	66	4·5	62·5	6·6	14·7	37	...	2·5	75%	Exhaust plant running from 9.30 to 10.0.
46	8.0 p.m.	(88%)	*(4·2)						Circle, 8.30	69	61·5	57	65	5·1	66	5·3	13·7	27	...	2·0	50%	
47									Gallery, 8.45	72	63·5	58	63	5·4	68	4·9	14·7	31	...	2·0	100%	
48									Stalls, 9.20	68	62	58	71	5·4	65·5	5·2	15·2	20	11	2·75	75%	
49									Circle, 9.40	69	61	56	63	4·9	66·5	4·8	12·6	17	...	2·25	50%	
50									Gallery, 10.0	72	63	58	61	5·2	68	5·3	17·5	44	10	2·75	100%	
51	15–7–26	54	45	34	16·5	25·3	263	Her Majesty's	Stalls, 8.15	67	57	49	53	3·9	63·5	5·5	13·4	22	...	3·25	100%	Dome closed over, one window partly open in gallery; ventilation plant not running.
52	7.50 p.m.	(48%)	*(2·3)						Circle, 8.30	66	55	46	48	3·4	62·5	5·8	14·7	24	...	3·25	100%	
53									Gallery, 8.45	69	59	52	55	4·3	65·5	5·2	10·3	25	...	2·0	100%	
54									Stalls 9.10	69	58	50	51	4·0	65	5·0	13·8	21	...	3·0	100%	
55									Circle, 9.25	66	56	48	53	3·8	63	5·8	16·2	24	...	3·25	100%	
56									Gallery, 10.0	69	58	50	51	4·0	65	5·4	12·0	30	...	2·25	100%	
57	29–7–26	57	52	48	10·2	21·6	78	St. James.......	Stalls, 8.20	63	56	51	64	4·1	60·5	7·0	17·4	36	...	4·0	40%	Ventilation plant not running.
58	8.0 p.m.	(71%)	*(3·8)						Circle, 8.50	67	58·5	53	60	4·4	64	5·7	14·2	27	...	3·5	15%	
59									Gallery, 9.05	71	61	54	56	4·7	67	5·2	16·2	34	...	2·5	85%	
60	10.15 p.m.	60	52	45	...	...	...	,, ...	Stalls, 9.20	66·5	58	52	59	4·2	63	7·1	18·2	60	...	3·75	40%	
61		(58%)	*(3·4)						Circle, 9·35	67	59	53	62	4·5	64	4·9	13·4	13	...	3·0	15%	
62									Gallery, 9·55	71	61	54	56	4·7	66·5	6·1	17·5	63	...	3·0	85%	
63	5–8–26	57	51	46	9·4	18·9	54	Her Majesty's	Stalls, 8.20	69	60	54	59	4·6	65·5	4·9	11·3	18	...	3·0	100%	No fans running; dome closed.
64	8.0 p.m.	(66%)	*(3·5)						,, 10.0	69	59	52	55	4·3	65·5	4·8	13·4	17	...	3·5	100%	
65									Circle, 8.50	66	58	52	61	4·3	63	5·3	14·6	15	...	3·5	100%	
66	10.40 p.m.	53	49	45	...	...	...	,, ...	,, 10.15	69	59	52	55	4·3	65	5·4	15·1	30	...	3·5	100%	
67		(75%)	*(3·4)						Gallery, 9.10	70	60	53	55	4·4	66	5·4	16·8	34	...	2·5	100%	
68	19–8–26	66	53	41	9·9	25·1	165	St. James.......	Stalls, 8.10	68	61	57	67	5·1	65	5·9	18·0	35	...	4·0	80%	All exhaust fans working.
69	8.0 p.m.	(40%)	*(2·8)						Circle, 8.20	73	60	51	46	4·1	67·5	5·2	18·0	48		3·0	90%	
70									Gallery, 8.35	71	58	48	45	3·7	66	5·3	20·5	36		3·25	100%	
71	10.0 p.m.	64	54	46	...	...	...	,, ...	Gallery, 8.50	71	58	48	45	3·7	65	6·4	20·5	84	10	3·75	80%	
72		(51%)	*(3·4)						Circle, 9.5	73	60	51	46	4·1	68	5·3	15·1	51	(aver-	3·75	90%	
73									Gallery, 9.25	73	60	51	46	4·1	68	4·8	15·1	34	age).	3·25	100%	
74	2–9–26	62	55·5	51	13·3	25·2	246	Her Majesty's	Stalls, 8.15	71	63	58	64	5·3	68	4·4	12·6	16	...	2·5	100%	Mechanical plant not running; side windows open in gallery; roof closed.
75	8.0 p.m.	(66%)	*(4·1)						Circle, 8.45	68	60	55	62	4·7	65	5·0	15·6	17	...	3·5	100%	
76									Gallery, 8.30	71	62·5	57	62	5·2	67·5	4·5	12·9	18	...	2·0	100%	
77	9–9–26	61	57	54	11·4	22·6	161	St. James ...	Stalls, 8.25	70	63	59	68	5·5	67·0	5·6	16·8	41		4·0	90%	Fans running intermittently.
78	8.0 p.m.	(78%)	*(4·7)						Circle, 8.40	70	63	59	68	5·5	67·0	4·8	10·5	20	17	3·0	70%	
79									Gallery, 8.55	73	64	59	61	5·4	69·0	5·0	15·6	42	(aver-	3·0	100%	
80									Stalls, 9.5	71	63	58	64	5·3	68·0	4·6	15·6	20	age).	3·75	90%	
81									Circle, 9.15	72	63	58	61	5·2	68·0	4·4	13·3	20		2·75	70%	
82									Gallery, 9.35	72	63	58	61	5·2	68·0	4·9	13·3	32		2·5	100%	
83	16–9–26	56·5	49	41·5	10·1	23·8	77	Her Majesty's	Stalls, 8.30	70	59	51	51	4·1	66·0	4·4	...	13	...	3·0	100%	Dome closed; ventilation plant not running; windows in gallery open.
84	8.0 p.m.	(57%)	*(3·0)						,, 9.25	72	60	52	49	4·2	67·0	4·4	10·8	21	...	2·5	100%	
85									Circle, 8.55	68	57·5	50	52	3·9	64·5	4·9	11·6	15	...	4·0	100%	
86									,, 9.45	68	57	49	50	3·8	64·5	5·0	9·7	17	...	3·0	100%	
87									Gallery, 9.10	71	59	50	48	4·0	66·5	5·0	10·8	29	...	3·5	100%	
88									,, 10.10	72	59	50	45	3·9	67·0	4·7	11·3	27	...	3·0	100%	
89	22–9–26	66	57	50	8·7	17·5	114	St. James ...	Stalls, 8.25	71	61	54	56	4·7	67·0	4·7	10·5	23	...	4·0	60%	Large fan running.
90	8.0 p.m.	(57%)	*(4·0)						Circle, 8.40	73	62	55	53	4·7	68·5	4·6	12·6	30	...	3·5	35%	
91									Gallery, 8.55	75	62	54	47	4·4	69·0	4·3	13·0	33	...	2·75	80%	
92									Stalls, 9.10	73·5	62·5	55·5	53	4·8	69·0	4·3	11·0	25	...	3·5	60%	
93									Circle, 9.40	73	63	57	57	5·0	69·0	4·5	11·0	28	...	3·0	35%	
94									Gallery, 10.0	74	63	56	54	5·0	69·5	4·3	10·0	27	...	2·25	80%	

* Grains per c. ft.

APPENDIX V—*continued.*

No.	Date and Time.	Outdoor Readings.						Theatre.	Place and Time.	Temperatures.						Dry Kata.	Wet Kata.	Air Movement, ft. per minute.	CO_2 parts per 10,000.	Comfort Vote.	Attendance.	Remarks.
		Dry Bulb, °F. (relative humidity).	Wet Bulb, °F. (absolute humidity).	Dew Point, °F.	Kata.		Air Movement, feet per minute.			Dry Bulb, °F.	Wet Bulb, °F.	Dew Point, °F.	Relative Humidity, per cent.	Absolute Humidity, grs. per c. ft.	Effective Temperature, °F.							
					Dry.	Wet.																
95	7-10-26	60	50·5	41	15·5	33·5	316	St. James ...	p.m. Stalls, 8.25	68	57	49	50	3·8	64·0	5·9	16·8	35	11	4·0	75%	CO_2 over ducts, ten parts; no exhaust fans running.
96	8.0 p.m.	(50%)	*(2·9)						Circle, 8.45	71	58	48	45	3·7	66·0	4·2	12·8	12	9	3·5	25%	
97									Gallery, 9.0	76	62	53	44	4·3	67·0	4·1	15·6	33	13	2·5	85%	
98									Stalls, 9.30	70	58	49	48	3·9	65·5	4·9	13·8	22	11	3·5	75%	
99									Circle, 9.40	74	61	52	47	4·3	69·0	4·0	13·3	20	9	2·75	25%	
100									Gallery, 10.0	77	63	54	45	4·5	71·0	3·8	16·8	30	11	2·25	85%	
101	14–10–26	73	55	38	6·4	23·5	101	Her Majesty's	Stalls, 8.15	76	64	57	51	4·9	71	3·5	11·3	16	...	2·5	100%	Ventilation plant not working; ceiling fan running in gallery; roof and windows open in gallery.
102	7.50 p.m.	(29%)	*(2·6)						Circle, 8.35	77	64	56	48	4·8	71	3·7	14·1	27	...	3·0	100%	
103	9.45 p.m.	74	58	45	...	...	...	,, ...	Gallery 9.05	80	66	58	47	5·2	73·5	3·2	11·9	31	...	2·5	100%	
104		(36%)	*(3·3)						Stalls, 9.25	79·5	66	58·5	48	5·2	73	3·0	12·9	20	...	2·0	100%	
105	4–11–26	63	47	27	9·5	16·8	110	St. James ...	Stalls, 8.10	70	53	36	29	2·3	64·0	5·2	11·6	30	11 (average).	4·0	75%	One small fan running at half-speed.
106	7.55 a.m.	(25%)	*(1·6)						Circle, 8.35	74	57	43	33	3·0	67·5	4·6	10·3	36		3·25	40%	
207									Gallery, 8.50	75	57	42	30	2·8	68·0	4·3	11·4	34		3·5	50%	
108									Stalls, 9.0	73	56	41	32	2·8	67·0	4·6	9·5	30		3·75	75%	
109									Circle, 9·40	76	59	46	34	3·3	69·0	4·5	9·9	49		3·5	40%	
110									Gallery, 10·0	76	58	43	31	3·0	69·0	4·3	10·1	40		3·0	50%	
111	24–11–26	62	54	47	15·1	34·8	335	St. James ...	Stalls, 8.10	72	60	52	49	4·2	67·0	5·6	17·5	53	...	4·0	75%	
112	8.0 p.m.	(59%)	*(3·7)						Circle, 8.25	72	61	54	53	4·6	67·5	5·0	13·7	34	...	4·0	20%	
113									Gallery, 8.40	74	61	52	47	4·3	68·5	4·6	17·4	37	...	3·5	100%	
114									Stalls, 9.20	73	61	53	50	4·4	68·0	4·5	11·4	28	...	3·5	75%	
115									Circle, 9.35	74	63	56	54	5·0	69·5	4·3	10·8	27	...	3·5	20%	
116									Gallery, 10.0	78	65	57	49	5·1	72·0	3·5	14·6	27	...	2·5	100%	
117	2–12–26	68	61	57	7·2	19·7	75	Her Majesty's	Stalls, 8.20	77	68	63	63	6·4	72·5	4·3	15·1	50	...	3·0	100%	Ventilating plant not working; ceiling fans running in stalls and gallery windows open in gallery; dome closed.
118	8.10 p.m.	(67%)	*(5·1)						Circle, 8.40	75	66	61	62	5·9	71·0	4·1	15·1	27	...	3·0	100%	
119									Gallery, 9.5	8·0	69	63	57	6·3	74·5	3·5	11·9	44	...	2·5	100%	
120	8–12–26	69	61	56	10·7	23·8	246	St. James ...	Stalls, 8.10	75	63	55	51	4·8	70·0	4·8	11·3	50	...	3·75	35%	
121	8.0 p.m.	(63%)	*(4·9)						Circle, 8.30	77	65	58	52	5·2	71·0	4·6	15·1	60	...	3·25	95%	
122									Gallery, 8.45	76	65	59	55	5·4	71·0	4·3	9·1	42	...	3·25	45%	
123									Stalls, 9.15	75	65	59	58	5·5	70·0	4·9	13·8	55	...	3·25	35%	
124									Circle, 9.35	78	66	59	53	5·5	72·0	4·2	14·6	51	...	2·5	95%	
125									Gallery, 10.0	77	66	60	56	5·6	72·0	4·1	14·6	43	...	3·0	45%	
126	6–1–27	68	65	63	9·9	26·0	203	St. James ...	Stalls, 8.20	74	69	67	78	7·2	71·5	4·7	17·5	39	...	3·0	85%	
127	8.15 p.m.	(85%)	*(6·4)						Circle, 8.30	75	68	64	70	6·6	72·0	4·7	14·0	48	...	3·0	60%	
128									Gallery, 9.0	78	69	64	63	6·6	73·0	4·2	16·5	55	...	3·25	100%	
129									Stalls, 9.20	76	68	64	66	6·4	72·0	4·5	12·8	49	...	3·0	85%	
130									Circle, 9.35	77	69	65	67	6·8	73·0	3·7	13·5	26	...	3·25	60%	
131									Gallery, 10.15	78	69	64	63	6·6	73·0	4·9	16·0	93	...	3·25	100%	
132	13–1–27	70	64	61	6·5	20·6	69	Her Majesty's	Stalls, 8.25	81	71	66	61	7·0	76	2·9	10·2	25	12	2·0	100%	Fans running; doors open,; dome open; windows open; fans running.
133	8.15 p.m.	(72%)	*(5·8)						Circle, 8.45	80	70	65	61	6·7	75	3·4	11·4	37	12	2·0	100%	
134									Gallery, 9.10	78	68	63	60	6·2	73	3·5	10·3	27	13	2·5	100%	
135	20–1–27	72	67	64	7·1	20·2	120	St. James ...	Stalls, 8.10	75·5	68·5	65	70	6·7	71·0	5·6	20·2	94	...	3·5	85%	No. 135 at back of stalls. No. 136 at side of stalls. CO_2 over grids, six parts per 10,000.
136	7.50 p.m.	(77%)	*(6·6)						Stalls, 8.25	74	69	67	78	7·2	71·5	4·6	16·2	36	8	3·0	85%	
137									Circle, 8.40	80	71·5	68	66	7·3	75·5	3·4	16·0	37	5	2·75	75%	
138									Gallery, 8.55	79	71	67	68	7·3	74·5	4·4	15·4	79	7	3·25	100%	
139	20–1–27	72	67	64	7·1	20·2	120	Her Majesty's	Stalls, 9.20	83	74	70	65	7·9	78·0	2·9	11·5	46	13	2·0	100%	Ceiling fans running in stalls and gallery; windows open in gallery.
140	7.50 p.m.	(77%)	*(6·6)						Circle, 9.50	77	69	65	67	6·8	73·0	3·4	11·1	20	8	2·5	100%	
141									Gallery, 10·15	77	70	67	71	7·2	73·5	3·2	11·4	15	8	3·0	100%	

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* Grains per c. ft.

No.	Date and Time.	Outdoor Readings.						Theatre.	Place and Time.	Temperatures.						Dry Kata.	Wet Kata.	Air Movement, ft. per minute.	CO_2 parts per 10,000.	Comfort Vote.	Attendance.	Remarks.
		Dry Bulb, °F. (relative humidity).	Wet Bulb, °F. (absolute humidity).	Dew Point, °F.	Kata.		Air Movement, feet per minute.			Dry Bulb, °F.	Wet Bulb, °F.	Dew Point, °F.	Relative Humidity, per cent.	Absolute Humidity, grs. per c.ft.	Effective Temperature, °F.							
					Dry.	Wet.																
142	25–1–27 8.0 p.m.	75 (86%)	72 *(8·1)	71	6·4	18·6	134	Her Majesty's	Stalls, p.m. 9.15	80	75	73	79	8·7	77·0	3·8	11·8	57	...	2·5	95%	Ventilation plant working; ceiling fans running in stalls; windows open in gallery.
143									Circle, 8.40	79	74	72	79	8·5	76·0	3·2	9·8	25	...	2·0	95%	
144									Gallery, 9.15	80	75	73	79	8·7	77·0	3·2	10·8	29	...	2·5	100%	
145	25–1–27 8.0 p.m.	75 (86%)	72 *(8·1)	71	6·4	18·6	134	St. James ...	Stalls, 9.25	78	73	71	79	8·2	75	4·2	12·5	57	...	3·5	40%	Main door open in gallery.
146									Circle, 9.40	76	72	70	82	8·0	72	6·1	19·8	133	...	3·5	30%	
147									Gallery, 10.20	80	73·5	71	74	8·2	75	4·8	12·0	124	...	3·5	90%	
148	27–1–27 7.55 p.m.	69 (85%)	66 *(6·6)	64	9·4	25·3	194	St. James ...	Stalls, 8.10	75	69	66	74	7·0	71·0	5·7	16·8	91	...	4·0	50%	
149									Circle, 8.25	76	69	66	70	6·8	72·0	5·3	12·6	83	...	3·5	30%	
150									Gallery, 8.40	74	71·5	70	89	8·2	73·0	3·5	13·0	9	...	2·5	90%	
151	27–1–27 7.55 p.m.	69 (85%)	66 *(6·6)	64	9·4	25·3	194	Her Majesty's	Stalls, ...	79	73	70	75	8·0	76·0	3·0	8·1	18	...	2·0	95%	
152									Circle, ...	77	71	68	74	7·4	74·0	3·3	9·7	16	...	2·5	70%	
153									Gallery, ...	80	72	68	68	7·5	76·0	3·4	13·6	38	...	2·75	70%	
154	1–2–27 7.55 p.m.	73 (78%)	68 *(6·9)	66	7·4	18·6	154	Her Majesty's	Stalls, 8.10	79	72	69	71	7·6	75·0	4·2	13·6	67	10	2·25	95%	Warm when walking, but not oppressive; ceiling fans working in stalls and gallery; mechanical plant running.
155									Circle, 8.25	77	70	67	71	7·2	73·0	4·8	13·0	73	7	3·5	50%	
156									Gallery, 8.35	77	71	68	74	7·4	74·0	3·5	11·2	21	7	2·5	100%	
157	1–2–27 7.55 p.m.	73 (78%)	68 *(6·9)	66	7·4	18·6	154	St. James ...	Stalls, 9.0	77	70	67	71	7·2	73·5	4·0	13·6	37	6	3·0	50%	Two exhaust fans running.
158									Circle, 9.15	78·5	71	67·5	69	7·3	74·5	4·1	12·6	55	4	2·5	45%	
159									Gallery, 9.25	78	71·5	69	73	7·6	75·0	3·5	13·0	27	6	2·5	70%	
160	3–2–27 8.0 p.m.	78·5 (30%)	59·5 *(3·2)	45·0	4·5	14·5	67	St. James ...	Stalls, 8.15	80	61	47	30	3·3	71	4·6	11·9	107	5	3·5	60%	Two exhaust fans running; main door open in gallery.
161									Circle, 8.40	81	62	49	33	3·7	72·5	3·2	10·3	37	8	2·75	25%	
162									Gallery, 9.0	83	63	49	31	3·8	73·5	3·1	10·3	56	6	2·5	80%	
163	3–2–27 8.0 p.m.	78·5 (30%)	59·5 *(3·2)	45·0	4·5	14·5	67	Her Majesty's	Stalls, 9.20	83	67	58	42	5·1	75·0	3·3	9·3	67	10	2·0	95%	Mechanical plant running; ceiling fans in stalls and gallery; doors open in circle; windows open in gallery.
164									Circle, 10.0	79	61	48	34	3·6	71·0	3·2	8·4	23	6	3·25	90%	
165									Gallery, 10.15	81	63	51	35	3·9	73·0	2·8	8·4	24	7	3·0	100%	
166	8–2–27 8.0 p.m.	67·0 (62%)	59 *(3·1)	53	5·0	7·7	14	Her Majesty's	Stalls, 8.15	78	67	61	56	5·8	73·0	2·4	6·5	<8	9	1·75	100%	Mechanical plant running; ceiling fans in gallery; windows open in gallery.
167									Circle, 8.40	78	66	59	53	5·5	72·5	3·4	7·7	24	10	2·25	70%	
168									Gallery, 9.15	78	67	61	56	5·8	73·0	3·3	7·8	20	11	2·25	100%	
169	10–2–27 7.50 p.m.	71·0 (66%)	63·5 *(4·9)	59	7·8	13·6	144	St. James ...	Stalls, 8.5	74·5	65	59·5	60	5·6	69	6·3	14·0	118	6	4·0	60%	All exhaust fans running; No. 170 half-way down aisle; main door open in gallery.
170									Stalls, 8.20	75·0	66	61	62	5·9	71	3·9	8·1	23	4	3·25	60%	
171									Circle, 8.45	73	66	62	69	6·1	70	4·0	8·6	15	4	3·5	30%	
172									Gallery, 9.10	77	66	60	56	5·6	71·5	4·7	7·8	66	5	3·25	70%	
173	17–2–27 7.55 p.m.	74 (63%)	65·5 *(5·8)	61	6·3	12·8	114	Her Majesty's	Stalls, 8.25	82	71	66	64	7·5	76·0	3·6	9·3	73	...	1·5	100%	People standing; No. 174 sense of freshness compared to other parts of stalls; ceiling fans running in stalls and gallery; windows open in gallery.
174									Stalls, 8.40	80	69	63	57	6·3	74·5	2·9	...	20	...	2·0	100%	
175									Circle, 9.10	78	67	61	56	5·8	73·0	3·6	9·1	32	...	2·5	100%	
176									Gallery, 9.25	78	69	64	63	6·6	74·0	3·2	7·7	17	...	2·0	100%	
177	22–2–27 8.0 p.m.	67 (66%)	60 *(4·8)	55	7·1	14·9	63	St. James ...	Stalls, 8.15	72	67	64	77	6·6	68·5	6·6	18·5	94	...	4·0	50%	All exhaust fans running.
178									Circle, 8.30	71	62·5	57	62	5·2	67·0	6·1	12·8	63	6	3·75	25%	
179									Gallery, 8.45	75	65	59	58	5·5	70·5	4·1	14·0	27	7	3·0	80%	
180	24–2–27 8.15 p.m.	71·5 (79%)	67 *(6·7)	64·5	4·0	18·2	10	Her Majesty's	Stalls, 8.30	81	73	70	68	7·8	77·0	3·1	9·8	35	11	2·5	100%	Mechanical plant not running; ceiling fans working in stalls and gallery.
181									Circle, 8.50	78·5	71	67·5	69	7·3	74·5	3·0	10·8	15	9	2·25	95%	
182									Gallery, 9.5	80	72	68	68	7·5	76·0	3·3	10·8	34	9	2·75	90%	
183	1–3–27 8.0 p.m.	74·5 (71%)	68 *(6·6)	64·5	6·5	20·6	128	St. James ...	Stalls, 8.15	76	70	66	74	7·2	72	5·1	15·7	76	4	3·75	40%	Two exhaust fans running; main door open in gallery.
184									Circle, 8.45	76	69	66	70	6·8	72·5	4·4	14·5	47	6	3·25	20%	
185									Gallery, 9.20	77	70	67	71	7·2	73	4·5	14·5	57	7	3·25	50%	
186	3–3–27 7.55 p.m.	76·5 (72%)	70 *(7·1)	66·5	10·8	25·7	531	Her Majesty's	Stalls, 9.0	82	74	71	69	8·1	78·0	2·6	11·0	23	10	2·25	90%	Mechanical plant not working; ceiling fans running in stalls and gallery; doors open in circle; windows open in gallery; close and smelly on entering stalls.
187									Circle, 8.40	79	72	69	71	7·6	75·5	3·5	10·3	33	6	2·5	70%	
188									Gallery, 8.10	78	71	68	71	7·4	74·0	4·5	12·2	72	6	2·75	90%	

* Grains per cubic feet.

APPENDIX V—*continued.*

No.	Date and Time.	Outdoor Readings.						Theatre.	Place and Time.	Temperatures.						Dry Kata.	Wet Kata.	Air Movement, ft. per minute.	CO₂ parts per 10,000.	Comfort Vote.	Attendance.	Remarks.
		Dry Bulb, °F. (relative humidity).	Wet Bulb, °F. (absolute humidity).	Dew Point, °F.	Kata. Dry.	Kata. Wet.	Air Movement, feet per minute.			Dry Bulb, °F.	Wet Bulb, °F.	Dew Point, °F.	Relative Humidity, per cent.	Absolute Humidity, grs. per c. ft.	Effective Temperature, °F.							
189	10–3–27	71	64	60	5·3	14·9	39	Her Majesty's	p.m. Stalls, 8.30	77	68·5	64	65	6·6	73·0	3·0	10·1	< 8	13	2·0	507 people	Mechanical plant not working; ceiling fans running in gallery; side door open in circle; windows open in gallery.
190	8.15 p.m.	(68%)	*(5·7)						Circle, 8.50	74	66	62	65	6·0	70·5	4·2	13·0	25	7	3·25	179 ,,	
191									Gallery, 9.0	76	68	64	66	6·4	72·0	3·7	11·9	20	8	2·25	347 ,,	
192	17–3–27	74	71·5	70	7·1	19·3	155	St. James ...	Stalls, 8.30	76·5	74	72·5	80	8·9	74	5·5	14·0	100	4	3·75	60%	Two exhaust fans working; all doors closed.
193	8.10 p.m.	(89%)	*(8·2)						Circle, 8.40	79	73	70	75	8·0	75	4·4	12·7	76	6	3·0	85%	
194									Gallery, 9.0	79	73	70	75	8·0	75	4·0	13·2	55	5	2·5	70%	
195	22–3–27	68	58	51	8·3	14·0	122	Her Majesty's	Stalls, 8.20	75	64	57	54	5·1	70	4·9	10·0	54	8	3·25	45%	Mechanical plant not running; ceiling fans working in stalls and gallery; doors open in circle; windows open in gallery.
196	8.10 p.m.	(54%)	*(4·1)						Circle, 8.45	74	63	56	54	5·0	69	4·7	14·2	41	7	3·25	35%	
197									Gallery, 9.0	76	64	57	51	4·9	71·0	4·0	13·8	30	7	3·0	40%	
									Other Theatres—Day and Night Observations.													
198	27–4–26	67	61·5	58	7·0	...	61	Criterion	Stalls, 8.25	71·5	65	61	69	5·8	69	3·9	11·4	9	...	2·0	85%	No fans; no mechanical plant.
199	7.45 p.m.	(71%)	*(5·2)						Circle, 8.40	73	63	57	54	4·8	69	4·5	13·1	28	...	3·0	45%	
200									Gallery, 9.0	73	65	60	63	5·6	69·5	4·4	10·6	26	...	3·0	50%	
201	26–5–26	62	53	45	10·8	22·4	145	Criterion	Stalls, 8.35	68	58	51	54	4·1	64·5	4·0	14·0	< 8	...	2·5	100%	No fans; no mechanical plant.
202	8.15 p.m.	(54%)	*(3·4)						Circle, 9.0	70	60	53	55	4·4	66	5·1	13·1	26	...	3·5	60%	
203	12–8–26	66	53	41	14·3	28·4	396	Haymarket ...	Stalls, 8.15	72	58	47	42	3·6	66	6·2	18·9	78	...	4·5	100%	Blowers working; ceiling fans not working.
204	8.0 p.m.	(40%)	*(2·8)						Circle, 8.30	72	59	50	45	3·8	67	5·1	16·8	38	...	3·75	100%	
205	9.30 p.m.	67	58	52	...	...	...	,, ...	Stalls, 9.20	72	59	50	45	3·8	66·5	6·0	18·9	70	...	3·75	100%	
206	13–1–27	69	63	59	6·5	20·6	69	Strand	Stalls, 9.15	75	66·5	62	64	6·0	71	4·8	16·2	51	...	3·5	80%	
207	10·30 p.m.	(72%)	*(5·6)						Circle, 10.15	77	67·5	62	61	6·1	72·5	4·0	13·8	36	...	3·75	80%	
208	8–3–27	65	58·5	54	8·6	23·1	98	Tivoli	Stalls, 8.15	75	65	59	58	5·5	70·5	3·6	8·7	15	11	2·5	100%	Ceiling fans in stalls and gallery; roof open.
209	7.45 p.m.	(68%)	*(4·7)						Circle, 8.35	73	63	57	57	5·1	69	3·9	13·6	15	8	3·0	100%	
210									Gallery, 9.35	72	62	56	57	4·9	68	4·1	13·6	15	6	3·5	100%	
211	15–3–27	72	68	66	10·5	29·9	316	Prince Edward	Stalls, 8.35	74	68	65	74	6·8	71·5	3·5	11·4	10	5	3·0	75%	Plenum plant without humidification.
212	8.0 p.m.	(82%)	*(7·0)						Circle, 9.10	76	68	64	66	6·4	72	4·0	9·4	29	5	3·5	60%	
213	1–3–27	75	68	64	...	...	...	Prince Edward	Stalls, 2.45	77	70	68	71	7·2	73·5	3·5	7·1	20	6	3·0	70%	Plenum and exhaust system with humidification.
214	3.23 p.m.	(70%)	*(6·6)						Circle, 3.0	76	70	67	74	7·2	72·5	4·8	7·6	62	5	3·5	25%	
215	2–3–27	76	68·5	65	7·3	12·7	214	St. James ...	Stalls, 2.50	75·5	68	64·5	68	6·5	72	3·9	9·2	25	4	3·5	80 people	No. 3 fan not running; all doors closed; thirty people in circle.
216	2.37 p.m.	(68%)	*(6·6)						Gallery, 3.0	78	69	64	63	6·6	73	4·6	7·8	74	6	2·75	160 ,,	
217	4–3–27	78·5	71	67·5	6·7	10·8	224	Tivoli	Stalls, 2.55	79	72·5	70	73	7·8	75	3·8	8·0	46	...	3·5	80%	No exhaust plant; ceiling fans working in all parts; doors and windows open, roof open.
218	2.35 p.m.	(69%)	*(7·3)						Circle, 3.45	79	72	69	71	7·6	75·5	3·6	7·6	37	...	3·5	50 people	
219									Gallery, 4.0	84	75·5	72	67·5	8·4	79	2·4	5·8	29	...	2·5	40%	
220	9–3–27	72	62	56	7·0	16·4	115	Palace	Stalls, 2.10	72	63	58	61	5·2	68·5	4·3	8·5	18	7	4·0	150 people	No ventilation plant working.
221	2.0 p.m.	(57%)	*(4·9)						Circle, 2.40	71	62	56	60	5·0	67	4·9	9·4	27	7	4·0	40 ,,	
222	11–3–27	75·5	68	64·5	7·5	12·6	215	Prince Edward	Stals, 2.45	76·5	68·5	64·5	67	6·6	73	3·5	6·7	18	5	4·0	200 ,,	Ventilation plant without humidification.
223	1.55 p.m.	(68%)	*(6·5)						Circle, 3.10	77	68·5	64	65	6·6	73	4·1	8·0	40	5	3·75	80 ,,	
224	15–3–27	85·5	65	52	3·5	12·3	144	Tivoli	Stalls, 2.45	80·5	70·5	65·5	61	6·8	75	4·0	8·5	77	21	2·5	100%	Fans running in all parts; windows open; doors open.
225	1.50 p.m.	(32%)	*(4·2)						Circle, 3.20	78	70	66	67	7·0	74	3·5	8·2	27	17	2·75	80 people	
226									Gallery, 4.8	85	75	71	62	8·0	79·5	1·6	5·5	< 8	18	1·0	90%	

* Grains per c. ft.

Appendix VI.—Determination of Carbon Dioxide Concentration by a Method suggested by W. M. Doherty, F.I.C., F.C.S.

The carbon dioxide concentrations were determined when possible by means of a Haldane carbon dioxide apparatus, on account of the ease and quickness with which the determination could be made. On some occasions, however, this apparatus was not in working order, and as the method of collecting samples in Winchester flasks and analysing in the laboratory is both slow and cumbersome, we decided to use a simple and efficient method suggested by Mr. W. M. Doherty, Second Government Analyst of the Department of Public Health.

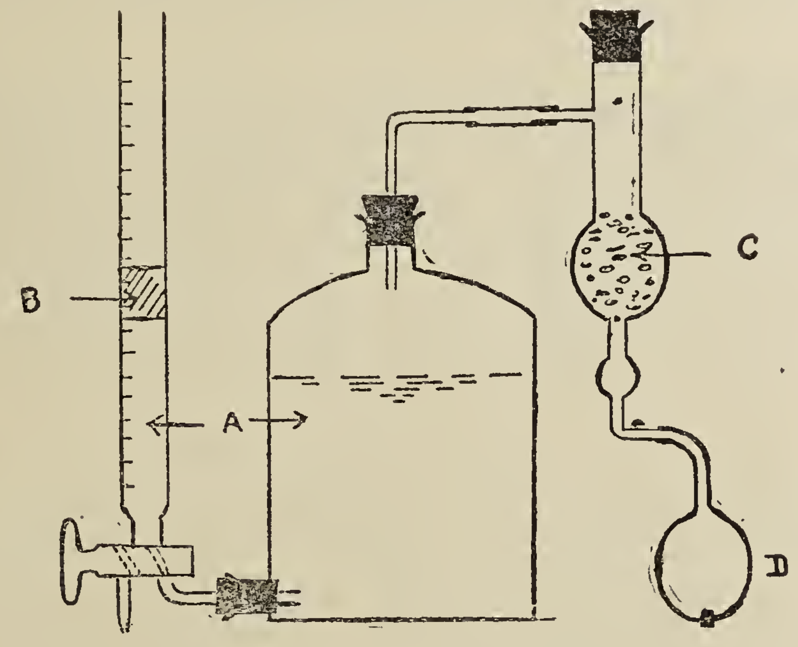
Mr. Doherty suggested collecting five samples simultaneously by emptying water from 100 c.c. flasks fitted with glass stoppers. This method was inconvenient owing to the noise caused by pouring water, and we made a number of tubes about 25 mms. in diameter, each with two tight-fitting rubber corks, so that the volume when the corks were in was 104, 106, 108 . . . c.c.'s. By waving these tubes rapidly to and fro the samples were collected and both corks fitted in each tube. The analysis was made on the spot immediately after collection.

It was found that unless great care was taken in handling the corks, higher concentrations were found than those obtained by Haldane's apparatus. This was probably due to sweat on the hands contaminating the corks ("Sweat gives an acid reaction, the acidity being due to acid sodium phosphate"). On this account we reverted to the 100 c.c. flasks, but collected the samples by exhausting with a small rubber syringe.

A standard solution of sodium carbonate coloured with phenolphthalein was used in the following manner to make the analysis:—

The solution was of such a strength that each c.c. was equivalent to ·01 c.c of carbon dioxide. Into the first flask 4 c.c. of the standard solution were added, and into the second 6 c.c., and 12 c.c. into the fifth flask. After shaking for five minutes (Mr. Doherty suggested 20 minutes, but experience showed that after five minutes no appreciable difference was noted), say the flasks to which 4 and 6 c.c. were added were clear, and the 8, 10 and 12 c.c. flasks still coloured. Then the CO_2 concentration was estimated at 7 parts per 10,000. A small correction should really be applied as the volume of the flasks when the solution has been added is less than 100 c.c., but this correction is negligible.

Care had to be taken to keep the standard solution from contamination and the air sample from dilution with fresh air when adding the solution. The apparatus as shown below was constructed and used at the theatres.



A Standard Solution of Sodium Carbonate.
B Kerosene to protect solution from air.
C Soda Lime used as a CO_2 filter.
D Rubber bulb fitted with valve to force solution into burette.

Diagram of Apparatus for use with Doherty's Method for Determination of Co_2.

The preparation of the standard solution is explained by quoting from Mr. Doherty's paper. "The standard solution is of such strength that each c.c. is equivalent to ·01 c.c. of carbon dioxide. The calculation and equation used in making the standard solution are here given:—

$$1 \text{ c.c. of } CO_2 \ \frac{44}{22320} = \cdot 001971 \text{ gramme.}$$

and according to the equation

$$CO_2 + H_2O + Na_2\,CO_3 = 2\,NaHCO_3$$

$$1 \text{ c.c. of } CO_2 \text{ converts } \frac{\cdot 001971 \times 106}{44} = \cdot 004748 \text{ gramme of } Na_2\,CO_3 \text{ into } NaHCO_3.$$

Thus a solution is made by dissolving 0·4748 gramme of sodium carbonate in 100 c.c. of water a half gramme of phenolphthalein being added as the indicator. This solution is carefully adjusted to its proper strength by titration within $\frac{N}{10}$ acid in usual manner. If properly made 1 c.c. will equal 1 c.c. of carbon dioxide (NTP). It can be kept for months unimpaired. The working solution is made by diluting this 100 times with distilled water, say 100 c.c. to a litre. A standard solution is thus obtained, 1 c.c. of which is equivalent to ·01 c.c. of carbon dioxide."

By reference to Table IV it will be seen that the method is quite trustworthy.

APPENDIX VII.

TABLE for determining Temperature of Dew Points in degrees Fahrenheit.
(Atmospheric pressure, 30·0 inches.)

Air Temp.	Depression of Wet-bulb Thermometer.																													
	0·5	1·0	1·5	2·0	2·5	3·0	3·5	4·0	4·5	5·0	5·5	6·0	6·5	7·0	7·5	8·0	8·5	9·0	9·5	10·0	10·5	11·0	11·5	12·0	12·5	13·0	13·5	14·0	14·5	15·0
50	49	48	47	46	45	44	43	42	41	40	38	37	36	34	33	32	30	29	27	26	24	22	21	18	16	13	11	8	4	0
51	50	49	48	47	46	45	44	43	42	41	40	38	37	36	34	33	32	30	29	27	26	24	22	20	18	16	13	10	7	3
52	51	50	49	48	47	46	45	44	43	42	41	40	38	37	36	34	33	32	30	29	27	26	24	22	20	18	16	13	10	7
53	52	51	50	49	48	47	46	45	44	43	42	41	40	38	37	36	34	33	32	30	29	27	26	24	22	20	18	15	13	10
54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	38	37	36	34	33	32	30	29	27	25	24	22	20	18	15	12
55	54	53	52	51	50	50	49	48	47	45	44	43	42	41	40	38	37	36	34	33	32	30	29	27	25	24	22	20	17	15
56	55	54	53	53	52	51	50	49	48	47	46	44	43	42	41	40	39	37	36	34	33	32	30	29	27	25	24	22	19	17
57	56	55	54	54	53	52	51	50	49	48	47	46	45	43	42	41	40	39	37	36	34	33	32	30	29	27	25	24	21	19
58	57	56	55	55	54	53	52	51	50	49	48	47	46	45	44	42	41	40	39	37	36	35	33	32	30	29	27	25	23	21
59	58	57	56	56	55	54	53	52	51	50	49	48	47	46	45	44	43	41	40	39	37	36	35	33	32	30	29	27	25	23
60	59	58	57	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	41	40	39	38	36	35	33	32	30	29	27	25
61	60	59	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	40	39	38	36	35	33	32	30	29	27
62	61	60	60	59	58	57	56	55	54	53	53	52	51	50	48	47	46	45	44	43	42	40	39	38	36	35	33	32	30	29
63	62	61	61	60	59	58	57	56	55	55	54	53	52	51	50	49	48	47	45	44	43	42	41	39	38	36	35	34	32	30
64	63	62	62	61	60	59	58	57	57	56	55	54	53	52	51	50	49	48	47	46	44	43	42	41	39	38	37	35	34	32
65	64	63	63	62	61	60	59	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	43	42	41	40	38	37	35	34
66	65	64	64	63	62	61	60	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	42	41	40	38	37	35
67	66	65	65	64	63	62	62	61	60	59	58	57	56	55	54	53	53	52	50	49	48	47	46	45	44	43	41	40	38	37
68	67	67	66	65	64	63	63	62	61	60	59	58	57	57	56	55	54	53	52	51	50	49	48	46	45	44	43	42	40	39
69	68	68	67	66	65	64	64	63	62	61	60	59	59	58	57	56	55	54	53	52	51	50	49	48	46	45	44	43	42	40
70	69	69	68	67	66	65	65	64	63	62	61	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	44	43	42
71	70	70	69	68	67	67	66	65	64	63	62	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	43
72	71	71	70	69	68	68	67	66	65	64	64	63	62	61	60	59	58	58	57	56	55	54	53	52	51	50	48	47	46	45
73	72	72	71	70	69	69	68	67	66	66	65	64	63	62	61	60	60	59	58	57	56	55	54	53	52	51	50	49	48	46
74	73	73	72	71	70	70	69	68	67	67	66	65	64	63	62	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
75	74	74	73	72	71	71	70	69	68	68	67	66	65	64	64	63	62	61	60	59	58	57	56	55	55	54	52	51	50	49
76	75	75	74	73	72	72	71	70	69	69	68	67	66	66	65	64	63	62	61	60	60	59	58	57	56	55	54	53	52	51
77	76	76	75	74	73	73	72	71	71	70	69	68	67	67	66	65	64	63	62	62	61	60	59	58	57	56	55	54	53	52
78	77	77	76	75	75	74	73	72	72	71	70	69	69	68	67	66	65	64	64	63	62	61	60	59	58	57	56	55	54	53
79	78	78	77	76	76	75	74	73	73	72	71	70	70	69	68	67	66	66	65	64	63	62	61	60	59	59	58	57	56	55
80	79	79	78	77	77	76	75	74	74	73	72	72	71	70	69	68	68	67	66	65	64	63	63	62	61	60	59	58	57	65

TABLE showing Absolute Humidities in grains per cubic feet at certain Dew Points.

Dew Point, degrees Fahr. ...	42	Absolute Humidity ...	3 grains per cubic feet.
,, ,, ...	50	,, ,, ...	4 ,, ,,
,, ,, ...	56	,, ,, ...	5 ,,
,, ,, ...	61	,, ,, ...	6 ,, ,,
,, ,, ...	66	,, ,, ...	7 ,, ,,
,, ,, ...	70	,, ,, ...	8 ,, ,,

Studies in Industrial Hygiene, No. 11.

The Cause of Occupational Dermatitis in Sydney Rubber Works in 1927.

BY

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K. R. MOORE—Medical Officer, Division of Industrial Hygiene, Commonwealth Department of Health.

Commencing with the use of organic accelerators in the rubber industry there arose a world wide experience of dermatitis among the workers. The organic compounds used have been various but the best known agent in the production of dermatitis has been hexamethylene-tetramine. In one Sydney factory the incidence of dermatitis due to this agent has been serious enough in the past few years to induce those in charge of production to give up using this chemical compound despite its marked technical advantages. One of us has had under observation during the past two years two rubber factories in Sydney and has noted the practical absence of occupational dermatitis in the one, and the marked incidence in the other. It was assumed that the use of hexamethylene-tetramine in the latter factory was the chief cause of the trouble and that with the cessation of its use (except in small and isolated batches) that the dermatitis incidence would decrease or cease if no new pernicious accelerators were used. For one year the regular use of hexamethylene-tetramine has been discontinued in Factory B and in its place the accelerators used have been tetra-methyl-thiuran-sulphide, diphenyl-guanidine, paraphenylene-diamine, and diorthotoluol guanidine. The occurrence of occupational dermatitis did not cease and inquiry revealed that the accelerator called BB was * a butyraldehyde condensation product of dimethyl paraphenylene-diamine which latter is a notorious cause of skin disease. While the accelerator BB was considered the most probable cause, nevertheless there is exposure to many potential causes of dermatitis in susceptible persons in rubber works and it was considered advisable to endeavour to delimit to the best of our ability the causes of their occupational disease. The fact that Factory A has been free from dermatitis during a period in which Factory B was seriously affected offered us very great help in excluding as a cause of trouble in Factory B various chemical compounds in use in both places. By this method of exclusion we have been able to decide that the following substances in use in both factories have not been the cause of dermatitis and that we might even go so far as to say that individuals susceptible to these substances are rare, for the smaller factory employed some 250 persons. It must be pointed out, however, that susceptibility may be a matter of one in thousands.

The substances we do not consider culpable in this particular investigation are—

Rubber, crude and reclaim; diphenyl-guanidine; tetra-methyl-thiuran-sulphide; mineral rubber (bitumen); sulphur; pine tar; lithopone; antimony penta-sulphide; paraffin wax.

While some of these substances will be suspect under other circumstances still we feel from our point of view in the present investigation that there is no evidence to suggest they cause dermatitis for they are in use in one factory in which no dermatitis is found. One reservation must be made and that is that the manufacture of pneumatic tyres is only done in one factory, otherwise, the work is of similar character. This reservation of pneumatic tyres may be important for there is a good deal of manipulation of green rubber stock by the hands and forearms in pneumatic tyre building. With the exclusion of these chemicals and rubbers we are able to focus our attention on certain substances found only in use in Factory B. These are the accelerators BB (paraphenylene-diamine?), di-orthotoluol-guanidine and a limited use of hexamethylene-tetramine.

BB was in use in Factory B for a period of three months in 1927 as accelerator in certain tyre compounds and scrap rubber containing it would not be used up for some further period. Consequently its presence in scrap rubber introduced the hazard into the shoemaking department in the manufacture of insoles and moreover BB was used as an accelerator in insole compounds until the beginning of June. The mill and calendar hands as well as the employees in the compound room were also exposed. Paraphenylene-diamine is a notorious skin irritant and dermatitis resulting from it has been reported as an occupational hazard in furriers and dye workers, as well as cases in the community generally, from the use of hairdyes containing it, and from wearing furs and hat bands treated with this substance. Consequently it is not surprising to find a body of workers coming into contact with a closely allied compound affected by a skin rash. The typical paraphenylene-diamine rash is described as an acute dermatitis with erythema, oedema, vesication and crusting (Sequira.)

Among the employees who had suffered and who were interviewed during the course of this investigation there was none showing active lesions, but every opportunity was taken to obtain an accurate description of the rash from which each worker had suffered. Those who had handled rubber compounds containing paraphenylene-diamine complained usually of a bright red very irritatable rash starting generally on the hands or forearms. In certain recurrent cases the rash which was described appeared to have become eczematous in character.

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* We have referred to this substance as paraphenylene-diamine in the rest of text.

Hexamethylene-tetramine was used in June and August in certain batches of rubber for tyre treads and side walls. Its use was dispensed with after a few days and it is now limited to the making of air bags which do not receive the same amount of handling as tyre components. Following on its use in June and August several tyre builders complained that the skin of the palms and fingers became fissured. The hands of these workers show marked callosities from their work and these callosities were chiefly affected. We saw two of these cases and the skin condition closely resembled that of a formaldehyde dermatitis. The incidence followed immediately after the introduction of hexamethylene-tetramine into certain tyre components for a few days, and has ceased since it has been withdrawn from use. By some chemical action probably due to a difference in handling a batch, the hexamethylene-tetramine appears to have produced formaldehyde rather than formic acid which gives rise to the typical " Hex " rash, and had acted on the palmar skin of these employees. Di-ortho-toluol-guanadine was used in 1927 in the manufacture of black shoe soles in Factory B. We have no knowledge that it acts as a skin irritant. This compound enters only into a few of the batches prepared and those exposed to it are mill-hands, dippers, and black shoe makers. We cannot incriminate this substance in the case of mill-hands and mixers owing to the varied exposure to other compounds. One case of occupational dermatitis occurred in the maker of black shoes and here there was exposure to insole compound containing paraphenylene-diamine. In all probability the latter substance caused the dermatitis.

Solvents.—In addition to these accelerators the use of benzine forces itself on our attention as a probable cause of dermatitis. Benzine is widely used as a solvent in many classes of rubber work. Both the factories visited use it extensively, factory A using Shell Benzine almost exclusively and factory B using Plume and Shell in equal quantities. Tyre builders and shoemakers are in constant contact with benzine, but it was observed in Factory A that kerosene was provided for the use of employees in cleaning hands, clothes, &c., whereas Factory B employees used the benzine with which they had been working for that purpose. Washing the hands in benzine caused a graver risk of injury to the skin than merely using the solutions containing benzine in the course of work, so that one must bear in mind that the more marked exposure to benzine in factory B may be a cause of dermatitis. Certainly, men engaged in slicking, that is wiping the inside of tyres with a mixture of talc and benzine are affected by it. The hands of these men are continously immersed in this suspension, moreover there is some friction between the hands and the edges of the pneumatic tyre. Women in the shoemaking department are also employed to wash the heels of shoes in benzine. In both these cases the continual defatting action of benzine must in course of time prove deleterious to any human skin.

Solvent Naphtha.—The coal-tar naphtha used in factory B is only found in the spreading department, and no dermatitis has followed from its use.

Consideration of Cases.—In considering the cases which have occurred since February of this year if we eliminate four, Nos. 22, 31, 34, and 47, which we do not consider as dermatitis definitely the result of contact with accelerators or solvents (even if they may be due to occupational causes), then with one exception, case No. 4, all the cases recorded have been exposed to paraphenylene-diamine, and in the case of No. 6, to hexamethylene-tetramine. Case No. 4 was a white shoemaker who had a rash on the arms and hands which appeared for the first time late in August, when there was said to be no exposure to paraphenylene-diamine. Benzine appears a likely cause in this case. We, therefore, conclude that paraphenylene-diamine was the chief cause of dermatitis in 1927 in Factory B. Since 1st August, 1927, its use has been discontinued, and ethylidine aniline has taken its place. There are appended two tables the first table showing the chief rubber compounds used for various articles in the two factories investigated. The organic accelerators and the solvents used are also indicated. In the second table details concerning the fifty cases of dermatitis which have recently occurred in one factory show, the date of occurrence, the character and location of the rash, the work of the individual affected, and the exposure to the different rubber compounds, accelerators, and solvents.

Notes—Summary and Conclusion.—(1) Two rubber factories were investigated in which the classes of goods manufactured warranted a comparison of the health hazard. In one factory one case only of dermatitis has occurred in the last twelve months amongst an average total of 250 employees. In the other factory 136 cases of dermatitis have been compensated during a similar period amongst an average of 1,500 employees.

(2) Of the cases in factory B the greater percentage occurred in the shoe-making and tyre-building departments and the mills which supply stock for the whole factory. These three departments account for 111 cases representing a case incidence per hundred employees of 8·6 per cent., 11·3 per cent., and 41·4 per cent. in the three departments mentioned.

(3) Fifty cases occurring since 1st February, 1927, have been tabulated (see tables Nos. 1 and 2) to show exposure to various hazards. A comparison between working processes and compounds used in the two factories reveal three factors which probably account for the high incidence of dermatitis in the one.

i. The use of a butyraldehyde condensation product of dimethyl-paraphenylene-diamine as an accelerator.

ii. The use for an isolated period of hexamethylene-tetramine as an accelerator for certain classes of goods which resulted in an outbreak of fissured palms and fingers in tyre builders, due apparently to an unusual liberation of formaldehyde as a decomposition product.

iii. The use of benzine for cleansing hands and arms.

Table I—Showing the chief rubber compounds used for various articles in the two factories investigated. The organic accelerators are mentioned separately and the solvents where used. The contractions for accelerators are those in general use :—

D.P.G.	...Di-phenyl-guanidine.
B.B.	...Para-phenylene-diamine.
E.T.A.	...Ethylidine aniline.
Tuads	...Tetra-methyl-thiuran-sulphide.
Hex	...Hexamethylene-tetramine.

Factories.	Compounds.		Accelerators.		Cure.		Solvents used.	
	A.	B.	A.	B.	A.	B.	A.	B.
Goods. 1. Tyres, pneumatic (*a*) Tread and side walls.	Not made	Crude rubber, gas black and fillers, sulphur, M.R.X. pine oil.	......	D.P.G. (Hex.)	......	Live Steam.		
(*b*) Breaker strip ...	......	......	......	D.P.G.	......	,,		
(*c*) Cushion and skin.	......	Rubber, Z.n.O, sulphur, pine oil.	......	E.T.A., B.B., till recently.	......	,,		
(*d*) Frictioned cord	......	As above with stearic acid.	......	,,	......	,,		
(*e*) Beads	......	As (*a*)	......	D.P.G.	......	,,		
1a Tyres (solid)	Smoked sheet rubber, carbon and sulphur.	Not made	None except litharge in ebonite.	......	Live Steam.	Dry Heat.		
1b. Retreads for tyres	Rubber, mineral rubber fillers.	Not made	D.P.G.	......	,,	......		
2. Tubes, inner	Not made	Rubber, antimony, sulphide, and fillers, paraffine wax, sulphur.	......	Nil	......	Live Steam		
3. Shoes—white (*a*) Soles and strip	Rubber and fillers ...	Rubber and fillers	Tuads	Tuads	Live steam	Dry heat.	Benzine (Shell).	Benzine (Plume Shell).
(*b*) Insoles and backing.	Imported reclaim, ground waste rubber.	White reclaim (imported), return cuttings of tyres until recently.	D.P.G. Tuads.	Tuads .... B.B.	,,	,,		
(*c*) Lining	Crepe rubber	Rubber, black reclaim (imported), fillers, linseed oil.	Tuads	Tuads Di-ortho-tolyl guanidine.	......	,,		
3a Shoes, black.	As white.							
4 Hose	Rubber, crude, imported, reclaim, mineral rubber, petrolatum, fillers.	Scrap, reclaim .... sulphur, fillers.	D.P.G.	D.P.G. .... B.B.	,,	,,		
4a Air brake hose ...	....	Rubber, fillers, including lithopone, sulphur.	......	D.P.G.	......	Live steam.		
5. Surgical excluding motor tubes.	Not made	Rubber, antimony, &c.	......	No organic accelerators.	......	......	......	Benzine (Plume Shell).
6. Moulds for milking machines.	Rubber, paraffin, antimony, lime.	Not made	Nil	....	Live steam.			
7. Cements— (*a*) Shoes	....	Sole rubber compound	D.P.G.	Tuads	......	......	Benzine (Shell).	Benzine (Plume Shell).
(*b*) Tyres ...... (wiping cores).	Not made	Crude rubber, resin......	......	Nil	......	......	Not made	Benzol Benzine (used in rest of tyre making process).
8. Mackintoshes and spread	Rubber, fillers, colours	Rubber, fillers, colours	Nil	Nil	Vapour cure S_2Cl_2	Vapour cure S_2Cl_2	Benzine (Shell)	Naptha coal tar, BP 120–180. S.G. ·815–·878.

Table II.—Cases of Dermatitis Investigated.

No.	Age.	Sex.	Primary or Recurrent.	Date of Onset or Recurrence.	Duration.	Character and Location.	Process last at.	Time.	Rubber Compound.	Accelerator.	Solvents.	Remarks.
1	49	M.	R.	1927. 25 Aug.	......	Erythema, hands and arms.	Cleaner (all dusts).	3 years...	....	Many	....	Original attack March, 1926.
2	22	M.	P.	30 May	......	Fissures, palms.........	Tyre builder	7 months	Tread and side walls, black shoes, cushion and skim-friction, cord and beads.	(1) Diphenyl Guanidine (D.P.G.); (2) Paraphenylinediamine (B.B.).	Benzine (Plume and Shell), Benzol (B.H.P.) (wiping cores).	
3	30	M.	R.3	19 May	......	Erythema turning to eczema, hands and feet between toes.	,, ...	6 months	As No. 2	D.P.G., B.B.	Benzine, Benzol.	
4	21	F.	P.	23 Aug.	10 days	Erythema, hands and arms.	Shoemaker (white).	4 months	White crude rubber, Eng., white reclaim, return scrap, ground rags.	Tetra-methyl triurane sulphide (Tuads).	Benzine.	
5	32	M.	R.	1 June (P.), 11 Aug.	27 days (P.), 18 ,,	Erythema, body and hands.	Dipping mill No. 5.	4 months	All stocks	D.P.G., E.T.A., B.B.. Tuads, Hexamine (few batches only).	Nil.	
6	20	M.	R.	May (P.) ... 4 Aug.	1 week (P.) 14 days.	Erythema, forearms	Labourer, Tyre Dept., No. 19.	3 years...	Friction cord and tyre arrangements.	D.P.G., B.B.	Benzine, Benzol.	
7	48	F.	P.	25 May	8 weeks	Erythema, abdomen thighs and chest.	Shoemaker (white).	4 years...	As No. 4	Tuads, B.B. in Insole compound.	Benzine	Still dipping.
8	37	M.	R.3	24 June	16 days	Erythema, arms and face and right side of neck.	Tyre builder	6 years...	As No. 2	D.P.G., B.B.	Benzine, Benzol.	
9	26	F.	R.	March (P.)... 25 May	18 ,, ...	Erythema all over body, starting on hands.	Shoemaker (Black).	5 years...	Black shoe rubber, imported black reclaim, black scrap.	Tuads, ? black scrap, B.B.	Benzine.	
10	21	M.	P.	9 June	1 week	Urticarial, left chest and forearms.	Improver, tyre dept.	1 week...	As No. 2	D.P.G., B.B.	Benzine, benzol.	Doubtful case
11	33	M.	R.3	17 May	5 weeks, with return to work 1 wk in between	Erythema both forearms.	Tyremaker	3 years...	As No. 2	D.P.G., B.B.	,,	
12	39	M.	R.	1 August ...	28 days	Erythema, arms and body.	No. 5 Mill mixer.	4 years...	All compounds (see (No. 5).	D.P.G., E.T.A., B.B. Tuads and Hex: (few batches only).	Nil.	

TABLE II.—Cases of Dermatitis Investigated—*continued.*

No.	Age.	Sex.	Primary or Recurrent.	Date of Onset or Recurrence.	Duration.	Character and Location.	Process last at.	Time.	Rubber Compound.	Accelerator.	Solvents.	Remarks.
13	46	M.	R.	1927. 6 May (P.)... 11 July.	Dismissed ...	Hands and arms, erythema.	No. 5 Mill dipping.	6 months	As No. 5	D.P.G., Tuads, B.B.,	Nil.	Septic burn of arm.
14	26	M.	R.	9 May (P.), 5 July	3 weeks ...... 4 ,,	Erythema between fingers and forearms.	Tyre-builder, No. 19.	6½ years.	,, 2	D.P.G., B.B.	Benzine, benzol.	
15	24	F.	R.	4 Mar. (P.), 4 July	1 month...... 1 week.	? Seborrhoeic dermatitis back of neck, chest and back.	Shoemaker (White).	5 years...	,, 4	Tuads, B.B. in scrap	Benzine.	Doubtful occupational origin.
16	32	M.	R.	17 May (P.), 1 July	3 weeks ...... 16 days.	Erythema, arms, forearms and neck.	Dipping, No. 5 Mill.	4 months	,, 5	D.P.G., B.B. Tuads...	Nil.	Still dipping.
17	22	M.	P.	16 June	2 weeks	Eczematous dermatitis, forearms ulnar surface of both.	Tyre-builder.	6 months	,, 2	D.P.G., B.B.	Benzine, benzol.	
18	22	F.	P.	21 May	3½ ,, ...	Erythema between fingers and on forearms, chest and legs.	Shoemaker (white).	5 months	,, 4	Tuads, ? scrap B.B....	Benzine.	
19	21	M.	R.	23 Mar., (P.), 20 April...... 30 May	3 weeks ...... 3 ,, ... 3 ,,	Erythema, left hand and forearms.	Calendar hand, No. 19.	1 year ...	Friction cord	B.B.	Nil.	
20	27	M.	P.	20 May	3 ,, ...	Erythema, groin and belt line, abdomen and thighs.	Solvent Dept.	2½ years.	Crude rubber, reclaim	Tuads, B.B.	All solvents.	
21	55	M.	P.	19 May	10 days	Erythema, arms	Engineer	1½ years.	....	....	....	Doubtful case.
22	24	F.	P.	18 May	19 ,, ...	Roughness of skin, back irritable at night.	Machinist, Shoe Dept., (white).	3½ years.	Canvas and shoe tacking (white).	In scrap, B.B., D.P.G.	Nil.	Doubtful occupational character.
23	41	M.	R.	1 Mar. (P.), 17 May	1 week ...... 2 weeks.	Erythema, arms, body and legs.	Cleaner, shoe floor.	3 years...	White shoe rubber, reclaim and scraps.	Tuads and B.B. in scraps.	Benzine.	
24	23	M.	P.	17 May	2 ,, ...	Erythema, hands and arms.	Dipping, No. 5 Mill.	5 months	As No. 5	D.P.G., B.B., Tuads..	Nil.	
25	28	M	P	11 May	2½ ,, ...	Erythema, hands and forearms	Tyre-builder No 19	1½ years.	,, 2	D.P.G., B.B.	Benzol, benzine	
26	20	M	P	6 May	1 week	Erythema, left hand and arm (radial aspect).	Improver, shoe dept	1 year 4 months.	White shoe rubber, reclaim and scrap	Tuads, B.B. in scrap..	Benzine.	
27	43	M	R	29 April ...	7 months ...	Erythema, arms, abdomen and legs and neck	Tyre maker	2 years...	As No 2	D.P.G., B.B.	Benzine, benzol.	
28	47	M	P	28 April ...	3 weeks	Erythema, belt line, abdomen and back	Storeman ...	9½ years.	Reclaim and crude ...	Many accelerators; dust from broken boxes	All solvents.	
29	47	M	R	7 Mar. (P.), 22 April.	2 months ...	Rash on hands with thickening.	Tyre-slicker	?	....	D.P.G. and B.B.	Benzine.	
30	20	M.	P.	21 April ...	2 ,, ...	Erythema, both hands and forearms.	Calendar hand, No. 19.	1 year ...	As No. 19	B.B.	Nil.	
31	23	F.	R.	19 April ...	3 weeks	Perionychia	Shoe-maker (white).	2 years...	,, 4	Tuads, B.B. in scraps	Benzine.	Doubtful case.
32	37	M.	P.	14 April ...	6 ,, ...	Erythema arms and neck.	Calendar hand and dipping, No. 19 Mill.	?	See No. 19.............	B.B.	Nil.	
33	24	M.	P.	18 Mar.	6 days	Erythema, forearms ..	Compound weigher, No. 5 Mill.	2 years...	Crude.....................	Many accelerators ...	Nil.	
34	39	F.	P.	14 Mar.	3 weeks	? Urticaria chest, back and legs.	Shoe-maker (white).	3 years...	See No. 4	Tuads, B.B. in scrap...	Benzine.	Doubtful occupational rash.
35	45	M.	R.	4 Mar. ...	? months ...	Erythema, arms and face.	No. 5 Mill, mixer.	1½ years.	All compounds	D.P.G., B.B., Tuads	Nil.	
36	48	M.	R.	1925. Sept., (P.)... 1927. 4 Mar.	10 weeks ... 10 ,, ...	Erythema on forearms.	Mixer, No. 5 Mill. Heater in moulds.	15 years.	See No. 5	D.P.G., Tuads, B.B.	Nil.	
37	29	M.	R.	1926. Aug. (P.) ... 1927. 4 Mar.	1 month...... 2 weeks.	Erythema, arms and hands.	No. 5 Mill mixer.	2½ years.	See No. 5	D.P.G., Tuads, B.B.	Nil.	
38	33	M.	P.	22 Feb.	3 ,, ...	Erythema, chest, abdomen and under arms.	Motor driver handles compounds.	10 years.	....	Many accelerators, dust from boxes.	All solvents.	
39	22	M.	P.	22 Feb.	1 week	Erythema, arms and left shoulder.	Labourer, tyre dept., No. 19.	1 year ...	Treads, side walls and other components.	D.P.G., B.B.	Nil.	
40	32	M.	R.	22 Feb.	6 weeks	Erythema, arms........	Compound weigher, No. 5 Mill.	9 months	Crude and reclaim.....	Many accelerators ...	Nil.	
41	17	M.	P.	18 Feb.	2 ,, ...	Erythema, arms and chest.	Rewinder, No. 19 Mill.	8 months	Cords and linings.......	D.P.G. and B.B.	Nil.	
42	50	M.	P.	16 Feb.	1 week	Erythema, arms........	Calendar hand, No. 19.	4 years...	Treads, cords, and other tyre components.	B.B., D.P.G.	Nil.	
43	41	M.	R.	8 Feb.	7 weeks	Erythema, arms and neck.	Mixer, No. 5 Mill.	2 years...	As No. 5	D.P.G., Tuads, B.B.	Nil.	
44	32	M.	R.	1926. Aug. (P.) ... 1927. 8 Feb.	10 days ...... 7 ,,	Erythema, arms, neck and chin.	Mixer, No. 5 Mill.	1 month..	,, 5	D.P.G., Tuads, B.B.	Nil.	
45	39	M.	P.	7 Feb.	1 week	Erythema of hands with thickening.	Tyre-maker	3 years...	,, 2	D.P.G., B.B.	Benzine, benzol.	
46	17	F.	P.	7 Feb.	....	....	Cleaning shoes with benzol.	...	....	Tuads and B.B. (doubtful exposure to insoles).	Benzine.	Left works.
47	61	F.	P.	7 Feb.	2 weeks	Shoulders, abdomen and thighs.	Bead remoulder.	7 years...	Rubber in solution ...	None	Benzine.	Doubtful case.
48	39	M.	P.	3 Feb.	8 ,, ...	Erythema, hands and forearms and lower eyelids.	Compound weigher, No. 5 Mill.	3 years...	....	Many accelerators ...	None.	
49	28	M.	P.	2 Feb.	4 months ...	Erythema, arms, turning to eczema.	Dipping, No. 5 Mill.	1½ years.	As No. 5	D.P.G., Tuads, B.B.	None.	
50	25	M.	P.	28 July	1 week	Erythema and thickening between fingers and on forearms.	Tyre-maker	5 months	,, 2	D.P.G., B.B.	Benzine, benzol.	

SECTION II.

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Notes on Vital Statistics supplied by Municipal Council of Broken Hill.

1.—Metropolitan Combined Sanitary Districts of Sydney.

Report of the Medical Officer of Health for the Year 1926.

J. S. Purdy, D.S.O., M.D., C.M.(Aberd.), D.P.H.(Camb.), F.R.S.(Edin.), F.R.San.I.

To the Director-General of Public Health.

Sir,

I have the honor to report on the health conditions of the Combined Sanitary Districts of the Metropolitan Area of Sydney for the year 1926. Both the death-rate and the infantile mortality rate were higher than the average for the previous five years.

On the 31st December, 1926, the population of the Metropolitan Combined Sanitary Districts was 1,221,330, an increase during the year of 37,650, equivalent to 3·18 per cent.; the death-rate was 10·36 per thousand of the population, 4 per cent above the average of the previous five years; and the infantile mortality was 59·2 per 1,000 births, 2 per cent. above the average of the previous five years.

Summary of Vital Statistics for 1926.

Metropolitan Combined Area, 442,981 acres (692⅙ square miles).
Population (estimated to the middle of the year), 1,200,450.
Births, 24,371 (birth-rate, 20·30).
Deaths, 12,433 (death-rate, 10·36).
Deaths of infants under 1 year of age, 1,443 (infantile mortality rate, 59·2 per 1,000 births).
Births in hospitals and institutions, 11,485 (47 per cent. of the whole).
Deaths in hospitals and institutions, 6,719 (54 per cent. of total).

Population.

Population.—The Metropolitan Combined Sanitary Districts for purposes of health administration consist of the Metropolis and Extra-Metropolitan District.

The Metropolis proper or " Sydney and Suburbs " includes the City of Sydney, forty municipalities, and Kuring-gai Shire.

The Extra-Metropolitan District is separately dealt with statistically, and includes twelve municipalities and two shires.

The population of the Metropolitan Combined Sanitary Districts at the end of 1926 was 1,221,330, the increase during the year being 37,650, equivalent to 3·18 per cent. The mean population was 1,200,450. The estimated population for 1950 at an annual rate of increase equivalent to that of last year would be 2,124,930. By calculation on the last decennial increase of population it would be 3,122,540, calculated (with logarithms) by geometrical progression on the known population for 1916 and 1926.

Metropolis proper (*Sydney and Suburbs*).—The population was estimated by the Government Statistician to be 1,070,510 on 31st December, 1926, of which the City of Sydney contained 107,880, an increase of 1,530, and the Suburbs 962,630, an increase of 29,590 for the year. The annual rates of increase between the last four Census was 2·33 per cent. from 1891 to 1901, 2·69 per cent. from 1901–1911, and 3·60 from 1911 to 1921. The annual rate of increase for twenty years up to 1921 was 3·15 per cent.

The mean population of the metropolis for 1926 was 1,057,180. The instances in which population figures as estimated by the Government Statistician have been altered in this report are in the case of the municipalities of Lidcombe, Hunter's Hill and Leichhardt, in the first of which there is a large Government Institution for the aged and infirm, and in the two latter of which there are large mental hospitals—Gladesville, 1,121 average daily number; Callan Park, 1076. As in previous reports, deaths among the inmates of these hospitals have been distributed to the districts in which they have previously resided. Consequently, whilst including the inmates in the total population for the metropolis, it was necessary to exclude the inmates of these hospitals from the estimate of the population of the municipalities in which they are situated.

Extra-Metropolitan District.—The estimated population was 150,820 on the 31st December, 1926, an increase of 5,820 (470 less increase than in the previous year). Mean population, exclusive of benevolent homes and mental hospitals, 140,720.

Births.

Metropolis.—The Government Statistician's report shows that the number of births registered in the Metropolis proper during the year 1926 was 21,487, equivalent to a birth-rate of 20·40 per 1,000 of population. Of the total, 10,992 were males, and 10,495 females, the proportion being 105 males to 100 females. The number of births was 549 below that of the previous year. The rate was 10·7 per cent. below the average of the preceding five years. The birth-rate for 1926 was the lowest recorded for the Metropolis. As a general rule, the birth-rate declines as the standard of comfort, convenience and earning power of the community increases.

The number of illegitimate children born during the year was 1,523, or 7·09 per cent. of the total births, equivalent to 1·45 per 1,000 of the population, which rate is 10·7 per cent. below the average of the previous five years. Of these children 78 per cent. were born in public institutions.

Extra-Metropolitan District.—Two thousand eight hundred and eighty-four births were registered during the year, equivalent to 20·49 per 1,000 of the population, being 10 per cent. below the quinquennial average. Included in the total were 78 illegitimate births, or 2·7 per cent. of the total, equivalent to 0·55 per 1,000 of the population.

TABLE I.

SHOWING Population, Density of Population, and certain Death-rates in the Municipalities of the Metropolitan Combined Sanitary Districts for 1926. including deaths which have occurred in General Hospitals, Special Hospitals for Consumption, and Hospitals for the Insane. Deaths occurring in Hospitals in the Metropolis have been distributed to their proper districts before calculating these rates.

Municipality.	Estimated Mean Population, 1926	Mean Density of Population to the acre.	Death Rate per 1,000 of Population.				
			All Causes.	Diarrhœal Diseases, including Enteritis.	Epidemic Diseases.	Tuberculosis of Respiratory System.	All Tubercular Diseases.
City of Sydney	107,030	33·0	13·59	·29	·48	1·37	1·47
Alexandria	10,130	9·6	11·25	·88	·39	·39	·39
Annandale	12,880	37·2	10·55	·15	·46	·31	·31
Ashfield	37,840	18·5	10·59	·74	·39	·50	·55
Balmain	32,600	33·4	11·16	·33	·36	·52	·64
Bexley	17,770	9·3	7·14	·50	·26	·50	·50
Botany	6,880	3·2	10·46	1·30	·29	·14	·14
Burwood	18,080	16·3	9·84	·71	·55	·49	·55
Canterbury	57,840	7·0	7·48	·48	·48	·36	·43
Concord	18,240	6·7	5·68	·27	·49	·27	·38
Darlington	3,650	67·6	10·68	·54	·27	·54	·54
Drummoyne	24,820	12·7	7·09	·24	·28	·08	·16
Eastwood	2,610	0·9	16·09	·38	·00	1·91	1·91
Enfield	11,980	7·1	9·93	·41	·33	·25	·41
Erskineville	7,570	40·7	9·52	1·06	·53	·26	·39
Glebe	23,000	44·4	9·21	·43	·47	·47	·56
Homebush	2,750	4·6	16·72	·72	·72	2·57	2·90
Hunter's Hill	8,950	6·3	14·41	1·00	·56	·56	·67
Hurstville	17,880	2·9	10·79	·77	·39	·67	·67
Kogarah	24,140	5·1	8·28	·49	·45	·37	·37
Lane Cove	12,970	5·1	6·86	·07	·23	·15	·23
Leichhardt	30,520	26·4	10·42	·33	·42	·62	·68
Manly	23,920	8·5	8·57	·46	·28	·28	·28
Marrickville	45,000	23·8	8·71	·28	·24	·33	·37
Mascot	12,150	5·5	8·06	·57	·41	·41	·41
Mosman	23,270	10·9	8·63	·21	·34	·25	·30
Newtown	28,390	59·1	11·44	·38	·35	·73	·95
North Sydney	52,480	20·8	9·01	·20	·40	·40	·47
Paddington	26,710	63·4	13·85	·29	·37	·59	·67
Petersham	27,320	32·1	9·26	·25	·25	·58	·66
Randwick	65,250	7·7	7·26	·18	·27	·42	·50
Redfern	24·080	59·6	11·12	·58	·78	·33	·49
Rockdale	31·950	6·3	7·54	·21	·34	·34	·47
Ryde	20,950	3·0	9·11	·38	·28	·52	·61
St. Peters	13,380	14·8	8·29	·52	·37	·44	·59
Strathfield	10,830	6·1	7·11	·18	·64	·55	·55
Vaucluse	5,910	7·4	8·63	·33	·50	·66	·84
Waterloo	11,700	14·1	11·90	1·27	·81	·72	·91
Waverley	46,760	21·4	9·34	·32	·38	·49	·51
Willoughby	38,100	7·0	8·00	·20	·28	·41	·52
Woollahra	30,990	16·4	8·06	·09	·54	·61	·71
Ku-ring-gai Shire	23,910	1·1	7·94	·25	·37	·54	·67
Total Metropolis	1,053,180	9·0	9·54	·37	·42	·54	·61
Extra Metropolitan Municipalities.							
Auburn	17,210	6·6	10·98	·46	·17	·34	·34
Bankstown	16,480	0·8	4·48	·30	·06	·42	·48
Cabramatta and Canley Vale	4,030	0·5	4·71	·00	·00	.00	·00
Dundas	4,800	1·7	4·79	·60	·00	·41	·41
Ermington and Rydalmere	2,010	1·0	58·70	1·49	2·98	3·76	3·76
Fairfield	6,820	0·4	4·69	·29	·15	·29	·29
Granville	16,410	4·0	6·39	·24	·42	·30	·36
Ingleburn	*1,480	0·1	6·08	·00	·00	·67	·67
Lidcombe	13,190	2·5	40·33	2·42	·45	1·89	2·04
Liverpool	5,860	0·2	26·62	1·19	·85	·51	·68
Parramatta	16,190	7·2	16·61	·55	·67	1·17	1·23
Prospect and Sherwood	12,040	1·2	5·89	·16	·41	·66	·66
Hornsby Shire	18,490	0·1	8·32	·21	·32	1·56	1·62
Warringah Shire	13,740	0·2	5·16	·14	·14	·21	·21
Total	148,750	0·5	12·17	·56	·35	·79	·86
Total combined Metropolitan Sanitary Districts	1,201,930	...	9·85	·39	·41	·57	·58

* The Government Statistician's return (1,200,450) does not include Ingleburn.

DEATHS.

Metropolis.—The recorded deaths for 1926, after correction and including those for institutions totalled 10,056, equivalent to a rate of 9·3 per 1,000 of the population. The rate is 3·5 per cent. above the average of the preceding five years. The number of children under 1 year of age who died was 1,315 or 61·2 per 1,000 births, 2·2 per cent. above the average of the previous five years, which were years of low mortality.

In the year 1922, the general death-rate of 8·16 per 1,000, and the infantile mortality rate of 56 per 1,000 births was not only the lowest ever recorded in the metropolis, but gave to Sydney the proud distinction of having the lowest death, and one of the lowest infantile mortality rates of any city in the world with a population of over 500,000. In 1923 the death-rate was 9·6, and the infantile mortality rate 63·9. In 1924 the rates were 9·28 and 57·2 respectively. In 1925 the rates were 9·03 and 57.

The number of persons aged 65 and over who died in 1926 was 3,574, or 35 per cent. of the total deaths, which is 10·1 per cent. above the average mortality at this period of life. Of these, 87 were aged 90–94, nine were 95, four 96, seven 97, two 98, two 99, one 100, and one 102.

Diseases of the Heart.—An analysis of the chief causes of death in the metropolis shows that the group, Diseases of the Heart, again occupies the premier position, accounting for 1,547, or a rate of 146 per 100,000.

In 1913, with a mean metropolitan population of 710,100, there were 653 deaths ascribed to diseases of the heart, giving a rate of 92 per 100,000. In 1914 the rate was 98; in 1915, 122; in 1916, 122; 1917, 116; 1918, 119; 1919, 122; 1920, 119; 1921, 117; 1922, 115; 1923, 133; 1924, 132; and in 1925, 143. From the above figures it will be seen that there has been a progressive increase in the death-rate from diseases of the heart.

In Sydney in 1903 heart diseases formed 8 per cent.; in 1913 nearly 9 per cent.; in 1923 and in 1926, as much as 15 per cent. of the deaths.

As pointed out in last year's report in comparing the death-rates in Sydney with those from Glasgow, the apparent increase of diseases of the heart might be ascribed to what Dr. Chalmers called the result of denudation, a process akin to what the geologist means by the term. Some diseases, without being necessarily more prevalent, have become more prominent among the prevailing causes of death owing to differences in the rate of movement.

As to sex, there were 781 deaths from heart disease among females to 766 among males.

With regard to the rheumatic affections, the great congener of heart disease, the group of diseases including chronic rheumatism, chronic arthritis, rheumatoid and osteo-arthritis, and gout with rheumatic fever, only accounted for 51 deaths, or 5 per 100,000. Of these deaths 32 were due to acute rheumatic fever, two-thirds of which occurred between 5 and 19 years. There were only 4 deaths from rheumatic fever between 20 and 30 years of age. Between the ages of 5 and 24 years there were more males died from rheumatic fever in Sydney in 1926 than females, the figures being 13 and 11 respectively.

Under 25 years there were 34 males and 15 females died from heart disease. From 25 to 40 years there were 40 males to 52 females died therefrom. From 40 to 75 years there were 521 deaths of males to 412 deaths of females from diseases of the heart. Occupation is the main factor in the difference in the rates in men and women.

There is a wide field for propaganda to make the public realise that heart disease, degenerative changes in the arteries and the (of recent years) frequent diagnosis of high blood pressure, are to some extent preventable by a campaign against syphilis and alcohol, the elimination of lead poisoning, and the prevention of over-fatigue both in work and play of men over fifty.

Those attaining 40 years of age should submit to medical examination, and if thereafter they do not make it a birthday event should at least have an overhaul on the completion of each decennial period of life. Insurance companies find that it is of benefit to both their funds and their clients to encourage medical examinations with a view to warning people and keeping them fit.

Cancer.—Perhaps the disease most dreaded with a toll of 1,100 deaths in the metropolis, and 224 in the extra metropolitan area, comes next on the list of killing diseases. Five hundred and twenty-two males and 578 females died from cancer in the metropolis in 1926; 60 to 70 years of age was the most fatal period in both sexes.

As to the site of the disease and the association therewith of chronic irritation as a determining factor, it is noted that only 8 females died from cancer of the buccal cavity (mouth) in contrast to 63 males so affected. This strongly suggests smoking as a possible source of irritation, and a warning to men to immediately seek advice with regard to any sore on the lip or tongue. Cancer of the female genital organs and of the breast caused 240 deaths of women over 30 years of age.

Pneumonia, as in previous years, follows as the third most important cause of death with a total of 825, an increase of 11 per cent. on the average for the previous five years. From broncho-pneumonia the deaths of males were 158 to 146 females. After 30 years of age there were 229 males to 168 females died from pneumonia (other). Inhalation of dust in certain occupations and indulgence in alcohol rather than exposure in a climate such as ours are suggested as the main factors causing the difference in sex incidence in the second half of life.

Bright's Disease (acute and chronic) claimed 549 victims, a decrease of 8 per cent on the average number for the previous five years. Acute nephritis (including six unspecified under 10 years) only accounted for 12 males and 14 females; chronic nephritis accounted for the deaths of 275 males and 248 females. Between 45 and 70 years there were 146 deaths in males from nephritis to 114 in females. The excess of deaths in males may be ascribed to occupation and to over-eating, especially of meat.

Cerebral Hæmorrhage accounted for the deaths of 250 males to 270 females, the total of 520 being an increase of 142 or 38 per cent on the average number of the previous five years.

Pulmonary Tuberculosis.—In 1926, according to the Government Statistician, there were, in the metropolis, 468 deaths from tuberculosis of the respiratory system, actually the average of the previous five years. Corrected, however, for deaths in institutions outside the metropolis, including Waterfall Sanatorium, there were 575 deaths from pulmonary tuberculosis in 1926. The reduction of the mortality from pulmonary tuberculosis during the past twenty-five years may be credited to some extent to the intensive propaganda on the prevention of tuberculosis, instruction given in sanatoria, better housing, increased wages, better feeding and more appreciation of fresh air. It is encouraging to find so eminent an authority as Sir Robert Philip, in his presidential address at the annual meeting of the British Medical Association in Edinburgh, prophesying, on the necessary assumption that the methods of prevention are vigorously pressed, that his successor at the next Edinburgh meeting—say, thirty years hence—will speak of tuberculosis as largely a memory of the past.

Epidemic Diseases.—There was a marked increase in the number of deaths from measles, which accounted for 45 deaths in contrast to an average number of 23 for the preceding five years, and 11 for the previous year. Thirty-four of the deaths (20 males and 14 females) were under 5 years. Four females died from measles between the ages of 25 and 54 years.

Forty-two deaths from scarlet fever in 1926 gave six times the average of the preceding five years. To get similar numbers of deaths from scarlet fever, we have to go back to 1915, 1916, and 1902, 1903 (see graph, p. 42.)

Whooping cough accounted for 73 deaths, an increase of 18 per cent. on the average of 62 for the previous five years. Compared to the previous year, when there were 54 males and 70 females died from whooping cough, there has been a considerable decrease. Under 1 year of age there were 16 males and 22 females died from whooping cough ; under 5 years of age the incidence of deaths was 31 and 39 respectively.

Influenza, with 141 deaths to its credit, showed an increase of 34 per cent. on the average of 105 for the previous five years.

Infantile paralysis caused 9 deaths in contrast to 4 as the average for the previous five years.

Epidemic cerebro-spinal meningitis 14 deaths, the average being 12 for the previous five years.

Lethargic encephalitis accounted for 25 deaths, the average for the previous five years being 16.

The only infectious diseases to show decreases were diphtheria and typhoid fever. There were 71 deaths from diphtheria in 1926, a decrease of 19 per cent. on the average of 88 for the previous five years. Typhoid fever in 1926 caused 23 deaths, a decrease of 41 per cent. on the average of 39 for the previous five years, and 9 deaths less than in the preceding year.

Diabetes accounted for 134 deaths, a decrease of 12 on the average for the previous five years. As noted in previous years the majority of the deaths occurred in the sixth decade of life, later on the average than in England and the United States. Contrary to the usual incidence in those countries, in Sydney women die more frequently than men from diabetes. The usual incidence is in the ratio of 3 men to 2 women, but in Sydney the reverse obtains, the ratio being 3 women to 2 men, or 70 to 99 in 1924, 53 to 80 in 1925, and 53 to 87 in 1926. As the predisposing causes of diabetes are said to be severe nervous strain and worry, and the disease is more common in those not engaged in manual labour, the absence of domestic help is suggested as a factor in the relatively unusually high incidence among elderly women in Sydney.

Diarrhoea and Enteritis accounted for 344 deaths of children under 2 years, a decrease of 13 per cent. on the average of 395 for the previous five years. This is the most gratifying feature one has to record, especially in view of the fact that the deaths from diarrhœa and enteritis over 2 years of age showed an actual increase of 14 per cent. over the average of 84 for the previous five years. The work of the Baby Clinics undoubtedly is a feature in reducing gastro-enteritis in children under 2 years.

Maternal Mortality.—It is pleasing again to record, as in the previous three years, a reduction in the number of deaths from the preventable disease, puerperal septicæmia. There were 30 deaths in childbirth from puerperal septicæmia in the metropolis in 1926, of which 16 were in mothers under 30 years of age. The reduction was 27 per cent. below the average of 41 for the previous five years. There were 110 deaths from other puerperal diseases, a decrease of 12 on the number for 1925 and of 3 per cent. for the average of the previous five years. There were 26 deaths from puerperal albuminuria and convulsions in contrast to 34 therefrom the previous year. Puerperal hemorrhage caused 15 deaths, 3 less than in the previous year. " Other accidents of labour " were credited with 7 deaths, exactly half the number of the previous year. Ninety deaths of women in the metropolis, either in or actually after childbirth, gives a death-rate in childbirth, or associated therewith, of 4·6 per 1,000 births, the lowest yet recorded. Eight deaths from ectopic gestation, 3 from accidents of pregnancy, and 36 from illegal operations are not included in the above figures. It is interesting to note whether the maternal mortality rate in the metropolis, as has hitherto been the case, contrary to the experience in most countries, remains higher than in the country centres. The increased attention recently given to this subject probably is already showing in the improvement in the mortality rate. The more intensive training of the future practitioners, increased provision of lying-in facilities, and, above all, increased prematernity supervision, are the factors by which one expects to secure a further reduction in the future.

Infantile Mortality.—The deaths of infants under 1 year of age in the metropolis, as recorded by the Government Statistician during 1926, numbered 1,315, whilst the births numbered 21,487, giving an infantile mortality rate of 61·2 per 1,000 births. It is regrettable to record that this rate is 2·3 per cent. above the average of 59·8 of the previous five years. The increase was actually 4 per 1,000 above that of the previous year. The actual average infantile mortality for the last five years, including 1926, was 59·4 ; the average infantile mortality for the previous five-yearly period 1917–1921 was 68·2. The years 1919 and 1920 were years of high infantile mortality, being 79·4 and 74·2 per 1,000 births. From 1904, synchronising with the attention directed to a reduction of infant morality and the visitation of mothers by nurse inspectors of the City Council, and later of the Public Health Department, there was a progressive decline in infant mortality from 98 to 62 per 1,000 births in 1918. During the years previous to 1914 an investigation of all fatal cases showed that the incidence of gastro-enteritis was highest in artificially-fed infants. The proportion of entirely breast-fed children found on first visits in 1904 was 72·2 of all those visited ; in 1911 it had risen to 82·5 per cent ; in 1913 to 90·4 per cent. ; and in 1914 to 93·2 per cent. The increased percentage in the year 1913–1914 was ascribed to the fact that the children were seen on an average at an age of a fortnight younger than in the previous years, as a result of the introduction of the baby bonus, artificial feeding increased in proportion to the age of the child.

Of the deaths in 1926 from diseases associated with infant mortality there was a marked decrease from whooping cough.

Of the total of 1,315 deaths in the first year of life, no less than 532 occurred in the first week, and a total of 685, or more than half in the first month. In countries where there has been a general reduction in infantile mortality, it is found that there has been little change in the death-rate in the first month of life. Holland with its system of State and Municipal Midwives is said to be an exception in this regard. Of deaths from prematurity, congenital debility, injury at birth and other diseases peculiar to early infancy, 442 out of 590 died during the first week. One of the main causes of death in infants, diarrhœal diseases, caused 275 deaths, an increase of 64 on the number for the previous year.

Table 2.—(*a*) Showing Deaths of Children under 1 year per 1,000 births from 1880 to 1926, and (*b*) Deaths of Infants in the Metropolis from various causes 1916–1926.

(*a*)—Infantile Mortality per 1,000 Births, 1880–1926.

Year.	Deaths of Children under 1 year per 1,000 births.	Year.	Deaths of Children under 1 year per 1,000 births.	Year.	Deaths of Children under 1 year per 1,000 births.	Year.	Deaths of Children under 1 year per 1,000 births.
1880	192	1892	130	1904	98	1916	68
1881	162	1893	147	1905	89	1917	59
1882	183	1894	134	1906	84	1918	62
1883	163	1895	131	1907	96	1919	79
1884	172	1896	139	1908	82	1920	74
1885	187	1897	129	1909	81	1921	63
1886	173	1898	153	1910	82	1922	58
1887	141	1899	120	1911	71	1923	64
1888	152	1900	109	1912	76	1924	57
1889	172	1901	120	1913	78	1925	57
1890	135	1902	112	1914	69	1926	61
1891	148	1903	116	1915	72		

(*b*)—Showing Deaths of Infants under 1 year of age in the Metropolis from various causes, 1916–26.

Cause of Death.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.
Measles	5	3	8	1	20	3	1	6	2	1	8
Whooping-cough	60	19	26	17	121	27	24	24	16	68	37
Diphtheria and croup	22	14	14	6	11	11	10	12	5	10	10
Influenza	1	2	3	42	6	7	1	9	4	6	3
Cerebro-spinal meningitis	13	6	5	3	2	1	3	2	6	2	5
Tuberculous meningitis	5	5	8	4	1	9	8	2	3	1	4
Other tuberculous diseases	7	...	4	1	3	5	2	2	1	2	3
Meningitis	11	6	12	8	7	14	10	19	19	12	15
Convulsions	28	27	20	22	22	18	15	11	13	12	25
Other nervous diseases	5	4	1	6	8	4	1	2	3	1	8
Bronchitis	34	22	21	18	26	20	21	29	17	18	10
Pneumonia	129	95	102	124	126	101	132	129	138	132	97
Other respiratory diseases	4	6	...	8	12	6	2	2	4	3	1
Diseases of the stomach	10	11	12	8	11	12	6	6	5	5	6
Diarrhœa and enteritis	328	279	222	411	443	385	257	407	224	191	248
Intestinal obstruction and hernia	10	11	10	19	10	17	7	8	9	9	15
Bright's disease	1	2	3	3	...	2	2	...	5	...	1
Prematurity	369	307	351	409	440	379	362	379	382	354	386
Other developmental diseases	327	333	337	307	319	332	351	299	237	282	287
Accident	12	10	11	10	12	9	7	10	13	11	7
All other causes	47	50	55	56	58	52	57	47	156	66	67
Total	1,428	1,212	1,225	1,483	1,658	1,414	1,279	1,405	1,262	1,186	1,243

An analysis of the mortality shows that 143 infants died of gastro-enteritis between the ages of 6 and 12 months, 86 in the third, fourth and fifth months, and 45 in the second month, according to the records of the Government Statistician.

The deaths of infants from gastro-enteritis as a rule are related to the mean monthly temperature, the maximum temperature, and the rainfall.

Deaths from diarrhœa and enteritis under 2 years in May, June, July, August, September, and October, the months with the lowest mean temperature, were 26, 14, 14, 6, 3, and 18.

In November, December, January, February, March, and April, all months with a mean temperature over 66°, the deaths numbered 39, 56, 44, 45, 41, and 38.

The highest maximum temperatures were in December, January, and February, the months with the highest mortality from diarrhœa and enteritis.

The highest rainfall was in March, and the lowest in November. It is evident therefore that whilst in the warmer months enteritis is most prevalent, possibly the presence of flies from November to April is the concomitant factor which accounts for the higher incidence of the disease in those months.

Table 3.—Table showing for the Metropolis the population, number of deaths, and the death-rate per 1,000, together with deaths of children under 1 year and the infantile death-rate per 1,000 births during the last twenty years:—

Year.	Number of Deaths.	Ratio per 1,000 Living.	Deaths of Children under 1 year.		Year.	Number of Deaths.	Ratio per 1,000 Living.	Deaths of Children under 1 year.	
			Total.	per 1,000 Births.				Total.	per 1,000 Births.
1907	6,238	10·97	1,380	96·3	1917	7,518	9·75	1,212	59·8
1908	6,036	10·32	1,229	82·7	1918	7,862	10·02	1,225	62·7
1909	6,149	10·27	1,261	81·6	1919	11,907	14·69	1,483	79·4
1910	6,365	10·36	1,329	82·0	1920	11,449	12·21	1,852	73·9
1911	6,973	10·90	1,268	71·1	1921	8,276	9·07	1,414	63·0
1912	7,681	11·37	1,530	76·0	1922	8,043	8·16	1,239	56·0
1913	7,938	11·18	1,608	78·3	1923	9,351	9·65	1,405	63·9
1914	7,603	10·26	1,452	69·7	1924	9,185	9·29	1,418	56·8
1915	8,189	10·81	1,516	72·6	1925	9,377	9·15	1,255	57·0
1916	8,156	10·68	1,428	68·5	1926	10,220	9·70	1,315	61·2

Deaths from Accidents.—There has been an unfortunate increase of 25 per cent. in the number of fatal accidents on the average of the previous five years.

In 1926 there were in the metropolis 492 fatalities from accidents (including 38 from burns, 24 males and 14 females). Deaths from drowning—23 males, 2 females. It is pleasing to note a decrease in the deaths from drowning, which were as many as 46 in 1913. The death of 51 males from accidents on railways and tramways, 141 from vehicles and horses (an increase of 53 on the number in 1924, and of 19 on that of last year), may as to the latter be due to the serious and ever increasing congestion in the main arteries of traffic.

Lives are undoubtedly saved by the life-saving organisations on our beaches and by the Safety First campaigns of the Railway Commissioners and the Police.

It has been estimated that 65 per cent. of accidents are due to negligence, lack of thought, and above all lack of appreciation of danger.

Training in first aid by the classes of the St. John Ambulance Association and the inculcation of the ideas of safety first should be encouraged.

METEOROLOGY.

The following table compiled from information supplied by the Sydney Weather Bureau shows that the mean temperature of the air in Sydney during 1926 was 64·5 degrees Fahrenheit, which is 1·3 higher than the mean of sixty-seven years' observation.

An examination of the monthly means shows that the mean temperature was above the average during the months of January, February, March, April, June, July, August, September, October, and November, and below during May and December.

January and February were the warmest months of the year, whilst July was the coldest.

The rainfall for the year was 10·55 inches below the average of sixty-seven years.

The heaviest monthly rainfall was during the month of March, 12·19 inches; and the lowest in November, 0·13 inches.

TABLE 4.—Temperature and Rainfall, 1926.

	Temperature in Shade.			Departure of Mean Monthly Temperature from Average of 67 Years. (+ or —)	Rainfall.		
	Max. Extreme.	Min. Extreme.	Mean for Month.		Number of Rainy Days.	Amount, Inches.	Departure of Amount from Average of 67 Years. (+ or —) In Inches.
January	103·9	58·0	71·9	+ 0·53	13	3·53	— 0·14
February	107·8	61·0	75·9	+ 4·6	6	1·06	— 3·23
March	100·4	58·0	69·6	+ 0·3	14	12·19	+ 7·30
April	85·0	50·0	66·2	+ 1·5	11	3·16	— 2·21
May	74·8	46·9	58·7	— 0·1	15	2·94	— 2·23
June	70·3	44·1	57·0	+ 2·3	13	1·42	— 3·38
July	78·3	41·8	55·5	+ 2·9	11	2·35	— 2·55
August	76·2	42·2	56·7	+ 1·7	10	·93	— 2·11
September	84·9	44·1	59·8	+ 0·6	6	1·60	— 1·27
October	97·1	46·1	65·9	+ 2·4	8	·36	— 2·51
November	96·2	51·7	68·3	+ 1·3	4	·13	— 2·72
December	103·9	56·7	68·0	— 2·1	16	7·40	+ 4·60
Means and totals for the year 1926	......	......	64·5	+ 1·3	127	37·07	— 10·55

INFECTIOUS DISEASES.

TABLE 5.—Showing cases of Scarlet Fever, Diphtheria and Typhoid Fever notified in the metropolis and extra metropolitan districts, together with attack rates per 1,000 of the estimated mean population, year 1926.

Municipality.	Scarlet Fever.				Diphtheria.			Typhoid Fever.		
	Estimated Mean Population.	Cases Notified.	Attack Rate per 1,000 Living.	Death Rate per 1,000 Living.	Cases Notified.	Attack Rate per 1,000 Living.	Death Rate per 1,000 Living.	Cases Notified.	Attack Rate per 1,000 Living.	Death Rate per 1,00 Living.
					Metropolis.					
City of Sydney	107,030	177	1·65	·04	147	1·37	·02	20	·18	·06
Alexandria	10,130	21	·20	...	19	·19	...	...	·00	...
Annandale	12,880	27	2·19	...	31	2·40	·07	2	·15	·07
Ashfield	37,840	116	3·06	·02	62	1·63	·10	2	·05	...
Balmain	32,600	118	3·62	·02	43	1·31	·09	4	·12	·03
Bexley	17,770	73	4·16	...	21	1·18	...	2	·11	...
Botany	6,880	19	2·76	...	19	2·76	...	1	·14	...
Burwood	18,080	78	4·30	...	44	2·43	·16	5	·27	...
Canterbury	57,840	217	3·75	·07	116	2·00	·05	13	·12	...
Concord	18,240	39	2·13	...	46	2·52	...	1	·05	...
Darlington	3,650	4	1·09	...	3	·82	...	...	·00	...
Drummoyne	24,820	51	2·05	...	31	1·25	·08	1	·04	...
Eastwood	2,610	4	1·52	...	2	·76	...	1	·38	...
Enfield	11,980	56	4·67	...	32	2·67	...	3	·25	...
Erskineville	7,570	8	1·05	...	6	·79	...	3	·40	...
Glebe	23,000	48	2·08	...	43	1·87	·04	5	·21	...
Homebush	2,750	9	3·27	...	6	2·18	·36	...	·00	...
Hunter's Hill	8,950	53	5·08	...	3	·33	...	26	2·90	...
Hurstville	17,880	67	3·78	·11	29	1·62	...	6	·33	·05
Kogarah	24,140	73	3·02	·04	45	1·86	·08	3	·12	·04
Lane Cove	12,970	27	2·08	...	15	1·15	...	11	·84	...
Leichhardt	30,520	78	2·55	·03	52	1·70	·06	...	·00	...
Manly	23,920	25	1·04	...	35	1·48	...	5	·20	·12
Marrickville	45,000	133	2·95	·06	76	1·68	...	9	·20	...
Mascot	12,150	58	4·74	·16	19	1·56	...	12	·98	·08
Mosman	23,270	35	1·50	·04	11	·47	...	5	·21	...
Newtown	28,390	59	2·43	...	47	1·65	·07	6	·21	·07
North Sydney	52,480	108	2·06	·01	52	·99	·05	11	·21	...
Paddington	26,710	75	2·88	·03	49	1·83	·07	4	·15	...
Petersham	27,320	69	2·52	·03	29	1·06	...	5	·18	...
Randwick	65,250	131	2·00	...	87	1·33	·10	10	·15	·01
Redfern	24,080	36	1·49	·08	55	2·28	·12	6	·24	...
Rockdale	31,950	119	3·72	·03	61	1·91	...	10	·31	·03
Ryde	20,950	56	2·67	·09	36	1·71	...	10	·47	...
St. Peters	13,380	39	2·91	·07	27	2·01	·15	1	·07	...
Strathfield	10,830	50	4·61	·18	10	0·92	·09	1	·09	·09
Vaucluse	5,910	4	0·67	...	4	0·67	...	...	·00	...
Waterloo	11,700	25	2·13	·08	20	1·71	·17	4	·34	...
Waverley	46,760	140	2·99	·06	59	1·26	·02	14	·29	·02
Willoughby	38,100	104	2·73	...	79	2·00	2·10	5	·13	...
Woollahra	30,990	102	3·29	·06	24	·77	...	...	·00	...
Kuring-gai Shire	23,910	52	2·15	...	33	1·38	·04	5	·21	·04
Total, Metropolis	1,053,180	2,783	2·67	·03	1,628	1·54	·05	232	·22	·02
					Extra-Metropolitan Districts.					
Auburn	17,210	62	3·60	...	29	1·68	...	5	·29	...
Bankstown	16,480	103	6·25	...	32	1·84	...	...	...	...
Cabramatta and Canley Vale.	4,030	15	3·72	...	8	1·98	...	...	...	...
Dundas	4,800	25	5·20	...	38	7·91	...	1	·21	...
Ermington and Rydalmere.	2,010	...	...	...	1	·49	...	...	...	...
Fairfield	6,820	28	4·10	...	6	·88	...	3	·44	...
Ingleburn	*1,480	3	2·12	...	2	1·41	...	...	...	...
Granville	16,410	66	4·00	·006	34	2·06	·12	8	·48	...
Lidcombe	13,190	47	3·56	...	26	1·97	...	3	·22	...
Liverpool	5,860	11	1·87	...	7	1·19	...	1	·17	·17
Parramatta	16,190	41	2·53	...	21	1·29	·12	7	·43	·06
Prospect and Sherwood	12,040	26	2·15	...	34	2·82	·08	3	·24	·08
Hornsby Shire	18,490	44	2·38	...	22	1·19	...	4	·21	...
Warringah Shire	13,740	8	·58	...	14	1·01	...	2	·14	...
Extra Metropolitan Municipalities and Shires.	148,750	479	3·22	·006	274	1·84	·03	37	·24	·02
Combined Totals	1,201,930	3,262	2·71	·03	1,902	1·58	·05	269	·22	·02

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* The Government Statistician's return (1,200,450) does not include Ingleburn.

TABLE 6.—Notified Scarlet Fever in the Metropolis since notification became legal, showing Incidence and Mortality.

Year.	Cases.	Attack-rate per 1,000 of Population.	Deaths.	Case-fatality per cent.	Death-rate per 1,000 of Population.	Year.	Cases.	Attack-rate per 1,000 of Population.	Deaths.	Case-fatality per cent.	Death-rate per 1,000 of Population.
1898	2,425	5·37	25	1·03	0·07	1913	555	0·79	12	2·16	0·002
1899	556	1·20	10	1·80	0·02	1914	1,717	2·32	16	0·9	0·02
1900	464	·098	5	1·07	0·01	1915	4,190	5·53	48	1·14	0·07
1901	884	1·82	13	1·41	0·02	1916	2,468	3·24	38	1·53	0·05
1902	1,253	2·54	38	3·03	0·07	1917	1,110	1·44	9	0·8	0·01
1903	2,910	5·77	48	1·65	0·09	1918	637	0·81	11	1·7	0·01
1904	1,361	2·40	14	1·03	0·02	1919	376	0·46	7	1·86	0·008
1905	1,136	2·15	16	1·41	0·03	1920	346	0·41	5	1·44	0·006
1906	1,869	3·44	22	1·17	0·04	1921	407	0·44	5	1·22	0·005
1907	976	1·72	11	1·12	0·02	1922	554	0·58	4	0·74	0·004
1908	1,153	2·00	20	1·73	0·03	1923	1,369	1·41	8	0·58	0·008
1909	836	1·41	8	0·9	0·01	1924	1,921	1·92	12	0·62	0·001
1910	394	0·65	9	2·28	0·01	1925	1,705	1·66	13	0·76	0·001
1911	369	0·57	3	0·81	0·004	1926	2,783	2·67	38	1·36	0·03
1912	304	0·45	6	1·9	0·008						

The above table shows that during the past four years the incidence of scarlet fever has been higher than in the previous five years. With this disease there are periods of comparative quiescence followed by years, as at present, of increased incidence. Whether this is to be explained by the appearance of children who have not acquired immunity by a previous attack, or by some increase in virulence of the causative organisms, or from some other unknown cause, it is difficult to say. Attention in previous reports has emphasised the less virulence of the type of scarlet fever in Australia than that which obtained in England.

Last century scarlet fever was regarded as a highly dangerous infectious disease. The source of infection was either contact with the patient or was supposed to be from peeling of the skin or from bedding, clothing, or even letters from patients. Scarlet fever, however, is no longer the dangerous disease it used to be. Thus in England the death rate per 1,000 population has fallen from 1 or 1·2 in the sixties to ·02 in 1924. The case fatality is 1 per cent. in England compared with 12·6 per cent. in 1877–1881. The morbidity rate in England has not shown any decline, thus it was 2·9 per 1,000 in 1911, and 2·35 in 1925.

In Australia, as pointed out in a Bulletin published by the Office International d'Hygiéne Publique, in October, 1924, there has been increased incidence of scarlet fever "without increased mortality of late years."

In the Metropolis of Sydney for 1926, the death rate of ·03 and the attack rate of 2·6 per 1,000 showed an increase on previous years since 1916, whilst the case fatality of 1·3 per cent. was in excess of that of the previous five years.

Although it is believed that the patient himself is the main source of infection and that "bedside" disinfection, or the destruction of germs in the discharges from the mouth and nose of the patient, as well as bedding and clothes, and food utensils, is all that is required, routine terminal disinfection by spraying with formalin is still carried out.

It is generally held that notification, isolation in hospitals, and disinfection, have failed to prevent the spread of this disease.

In Great Britain during the War no harm apparently accrued from milder cases being treated in their own homes.

It is not essential, therefore, to provide hospital accommodation for all cases of scarlet fever. Where members of the family are employed in dairying or milk distribution or in supplying other food, or in clothes making, or where there are several susceptible children, isolation in hospital should be secured.

The future points to immunisation of the susceptible population as the most scientific method of combating this disease.

TABLE 7.—Notified cases of Diphtheria in the Metropolis since notification became legal, showing Incidence and Mortality in each year.

Year.	Cases.	Attack-rate per 1,000 of Population.	Deaths.	Case-fatality per cent.	Death-rate per 1,000 of Population.	Year.	Cases.	Attack-rate per 1,000 of Population.	Deaths.	Case-fatality per cent.	Death-rate per 1,000 of Population.
1898	613	1·43	75	12·23	·16	1913	2,841	2·89	96	4·70	·13
1899	285	·66	14	4·91	·03	1914	2,011	2·67	95	4·72	·11
1900	278	·63	21	7·55	·05	1915	2,295	3·03	95	4·13	·14
1901	439	·95	65	14·82	·13	1916	2,585	3·39	111	4·20	·15
1902	393	·79	37	9·41	·07	1917	2,261	2·94	72	3·18	·09
1903	690	1·37	73	10·60	·14	1918	2,085	2·65	87	4·17	·11
1904	738	1·40	45	6·10	·08	1919	859	1·059	37	4·30	·04
1905	695	1·19	42	6·60	·07	1920	1,618	1·92	90	5·46	·106
1906	659	1·21	32	4·85	·05	1921	2,475	2 709	90	3·63	·098
1907	659	1·16	46	6·98	·08	1922	1,513	1·607	62	4·09	·066
1908	880	1·53	38	4·20	·06	1923	1,485	1·53	77	5·18	·079
1909	1,144	1·93	42	3·70	·07	1924	1,847	1·85	75	4·06	·075
1910	2,109	3·47	61	2·89	·10	1925	1,428	1·39	55	3·85	·053
1911	1,834	2·86	58	3·16	·09	1926	1,628	1·54	57	3·50	·054
1912	2,632	3 92	105	3·9	·15						

The incidence of diphtheria in the metropolis in 1926 showed an increase of 200 cases on that of the previous year, but was actually 121 less than the average for the previous five years. The death rate of ·054 per 1,000 of population was on a par with that for the previous year, with the exception of that for 1919, the lowest yet recorded.

The low case fatality rate of 3·6 per cent. is due to the appreciation of more prompt treatment with anti-toxin.

The highest attack rate was in the Municipality of Botany, 2·76 per 1,000, represented by 19 cases in a population of 6,880. Enfield, with 32 cases in a population of 11,980, had the next highest attack rate, 2·67 per 1,000. Alexandria, with an attack rate of ·19 per 1,000, had the best record.

Immunisation.—It is now advocated that prophylactic injection of toxin-antitoxin should be given to all children before school age without a preliminary Schick test. The Schick test is merely a scientific means of determining whether or not an individual is susceptible to the disease, and does not in itself give any protection.

Toxin-antitoxin used in these injections gives protection or immunity against diphtheria over a long period of time, possibly for life. Antitoxin does not give protection against diphtheria, except for two or three weeks. A person who has had either diphtheria or antitoxin, after one month, should have the Schick test, as an attack of diphtheria also does not confer definite protection against a second attack.

The aim of research workers is to increase the efficiency of immunisation and to reduce the number of injections. It is expected that the number of injections may be reduced to two, and possibly with improvement in the future to one, which will considerably accelerate the practice of immunisation. With the co-operation of the medical staff of the Education Department it is hoped to carry out immunisation of school children in one of the metropolitan districts.

The popular belief still obtains that diphtheria is associated with defective drains, although there is no evidence to support the idea. Dampness is, however, possibly a predisposing cause, in that it produces an unhealthy condition of the mucuous membranes of the throat and nose, which favour the propagation of the bacillus. Sore throat and unhealthy tonsils predispose to attacks of diphtheria.

The injection of antitoxin does not remove the bacillus from the throat and nose although it protects against the effects of the toxin.

By introducing a measured quantity of toxin partially neutralised with antitoxin it is possible to produce immunisation. It has been stated that in the treatment of diphtheria anti-toxin was a *revelation,* but that the protection treatment as a means of prevention is a *revolution.*

It is recognised that it is possible to control the occurrence of diphtheria in the community, more especially in the young child from 1 to 7 years.

In New York, Boston, and Chicago (in the United States), in Edinburgh and Aberdeen (in Scotland), immunisation has been carried out as a routine procedure of the medical inspection of schools.

The pre-school child is, however, the most susceptible to the disease, suggesting that protective treatment might be made a feature of child welfare centres.

Typhoid Fever.

Table 8.—Notified cases of Typhoid Fever in the Metropolis since notification became legal, showing incidence and mortality in each year.

Year.	Cases.	Attack-rate per 1,000 of Population.	Deaths.	Case-fatality per cent.	Death-rate per 1,000 of Population.	Year.	Cases.	Attack-rate per 1,000 of Population.	Deaths.	Case-fatality per cent.	Death-rate per 1,000 of Population.
1898	824	1·93	73	8·86	·17	1913	566	·81	59	10·42	·09
1899	786	1·81	87	11·08	·20	1914	616	·81	82	13·31	·11
1900	983	2·25	103	10·47	·23	1915	746	·98	74	9·91	·11
1901	829	1·71	81	9·77	·17	1916	613	·80	65	10·06	·09
1902	610	1·23	59	9·70	·12	1917	371	·48	27	7·27	·04
1903	833	1·66	81	9·72	·16	1918	297	·37	51	17·1	·06
1904	665	1·29	64	9·62	·12	1919	300	·37	53	17·6	·06
1905	561	1·06	58	10·34	·11	1920	322	·38	45	13·97	·05
1906	485	·89	60	12·37	·11	1921	311	·34	44	14·14	·04
1907	505	·89	51	10·09	·09	1922	221	·29	41	18·5	·04
1908	678	1·17	75	11·06	·13	1923	217	·22	27	12·4	·028
1909	700	1·18	81	11·50	·14	1924	184	·18	18	9·80	·01
1910	812	1·33	84	10·34	·13	1925	187	·18	30	16·05	·029
1911	488	·76	50	10·24	·08	1926	232	·22	22	9·48	·020
1912	535	·80	53	9·9	·07						

Typhoid Fever Incidence.—With 232 cases notified in the metropolis for 1926, there was an increase of 45 cases on the number for the previous year. The attack rate of ·22 per 1,000 of population is equal to the average for the previous five years. No cases were reported from Alexandria, Darlington, Homebush, Leichhardt, Vaucluse, or Woollahra; Botany, Concord, Drummoyne, Eastwood, St. Peters, and Strathfield, each had a single case. Hunter's Hill, with 26 cases in December, an attack rate of 2·9 per 1,000, had the worst record.

Mortality.—There were 22 deaths, actually 8 less than in the previous year, whilst the case fatality was 9.48 per cent. An index of the progress of a community from a sanitary standpoint is a reduction in the morbidity and mortality from typhoid fever. The death rate from typhoid fever is now a twenty-fourth of what obtained in the metropolis of Sydney forty years ago.

Thus, giving the death rate per 100,000, the typhoid death rate in Sydney has fallen from 51·3 for the years 1888–1890 to 21·6 for 1891–1900, to 13·2 for 1901–1910, to 11·8 for 1910–1915, 6 for 1916–1920, and 2·9 for 1921–1925. For 1926 the death rate from typhoid was 2·08 per 100,000.

There were two interesting outbreaks of typhoid fever towards the end of the year, one associated with probable contamination of an old well, and the other with a milk supply.

1. On the 4th December, a patient of Brush Farm, a school for mentally defective girls at Eastwood in the municipality of Ryde, was sent to the Coast Hospital after a fortnight's illness. Another girl with a temperature, but without any previous history of illness, was sent the same day to the Coast Hospital.

On the 11th December another patient was sent to the Coast Hospital, whilst two more were sent to the Royal Alexandra Hospital for Children. The first two cases were definitely diagnosed as typhoid on the 8th December. On the 14th December, on receipt of notification from Ryde and Randwick municipalities, which had received notification on 11th December, the latter from the Coast Hospital, on investigation I found that three weeks previously the ordinary metropolitan water supply of Brush Farm had been temporarily cut off. An old well immediately in the rear of the building was brought into use as a source of water for cleansing purposes. The septic tank had been cleaned out by the Public Works Department two months previous to my visit. Later, however, the matron found that the drain from the bathroom and lavatory which passed near and immediately above the old well was blocked and that sewage had actually forced its way through and to the surface of the ground. This had been rectified on the 11th December, the pipes having been taken up and relaid.

On inquiry I actually found that the first patient had been seen with a mug of water obtained from the well. It appeared to me that the outbreak was suggestive of fæcal contamination of the well.

A report by the Microbiologist showed that whilst *B. typhosus* was not isolated from a sample of water, lactose ferments were present in 1/10 cc., indicating that the water was to be regarded as suspicious.

There were five cases associated with this outbreak. As soon as the disease was diagnosed the staff and inmates were inoculated against typhoid.

2. From 8th December to 31st December, 43 cases of typhoid fever were notified from Hunter's Hill, Lane Cove and Ryde municipalities; 41 cases had one source of milk supply, from a dairy situated in the last-named municipality. Thirty-one of these cases were notified as having the onset of illness during the last week in November or the first fortnight of December.

On 14th December, on visiting the dairy, I reported that the general aspect of the place showed neglect, general untidiness, and lack of realisation of the need for cleanliness. There was an offensive open drain in the cow-yard to which the cows had access. The milk room was not fly-proof. Both the privy of the dairy premises and of the dwelling of Chinese gardeners adjoining were not fly-proof, and both were in an insanitary condition.

The proprietor was warned of the risk that he ran of losing his licence. An examination of the books showed that there were 750 customers who were served by five milk runs.

The five carters were examined, and it was found that the cases at that date were confined to two of the runs, four cases in one and five on the other.

During the outbreak, with the exception of one case, the forty cases were confined to three out of the five milk runs. It was found that an employee had acted as a relief carter on these runs.

Bacteriological examination of the excreta of the milkers, the carters and members of the dairyman's family proved negative for typhoid. It was found, however, that two employees had left in the middle of November, and even with the assistance of the police, we were unable to locate them.

Of the two cases which did not receive milk from the suspected dairy, one case was supplied from another dairyman who was found to have supplied milk to two of the carters on the infected runs, and who gave a history of having had typhoid twenty-five years previously. Bacteriological examination of excreta in this case also was found negative.

Every house from which cases were notified was visited and instructions given for the improvement of the sanitary arrangements. In nearly every instance it was found that the patient had been a drinker of raw milk.

In six cases there were two cases in one family.

The outbreak was explosive in its onset, and, as typical of a milk outbreak, the cases were comparatively mild.

In the only fatal case, that of a man aged fifty, who died on 31st December, the date of onset of illness being given as 26th December, the milk was obtained from another dairy.

Extra Metropolitan.—In the extra metropolitan districts in 1926 there were 37 cases of typhoid, 1 more than in the previous year, and 23 less than in 1924. There were 8 cases in Granville and 7 in Parramatta, in contrast to 13 and 7 respectively in 1925. No cases were reported from Bankstown, Cabramatta and Canley Vale, Dundas, Ingleburn, Ermington and Rydalmere. As most of the extra metropolitan district and large portions of the metropolis are unsewered, the extension of the sewerage not having kept pace with the great increase of population, there are all the conditions associated with a dry conservancy system which encourage the spread of typhoid, and it is fortunate that there has been no serious epidemic thereof.

Prompt measures are taken by local inspectors to investigate the circumstances of each notified case of typhoid, and as far as possible cases are removed to hospital.

Separate emergency pans have to be provided for cases in unsewered areas, stools have to be disinfected, and if possible incinerated. A careful watch is kept on the milk supply so that on the least suspicion an investigation is carried out with a view to detecting a possible carrier or other source of contamination.

Year by year as the outlying suburbs become more closely built over, the problem of the disposal of night-soil becomes more difficult.

A judgment of the Supreme Court in 1926, which prohibits a local authority taking the night-soil to an area outside its boundaries and utilising a depot in another municipality, as was the case of Kogarah, which had a depot in Rockdale, has made this problem practically impossible of a satisfactory solution when there is not direct access to a sewer.

A further disability is the difficulty in unsewered areas of the disposal of household wastes. Technically, under the Local Government Ordinance each householder is responsible for the disposal of all waste waters within his own grounds. There are many instances of houses built on land with a slope to the front street, where it is extremely difficult to satisfactorily dispose of the sullage waters.

In some districts, such as Canterbury, there are large open drains, natural stormwater channels or creeks to which drainage naturally gravitates.

The Metropolitan Water, Sewerage and Drainage Board confines its operations for the concreting of such open channels to those which are on the boundaries of two local authorities.

Although no actual case of typhoid in 1926 was traced to the eating of oysters, this risk, especially from the picking of oysters from polluted portions of the harbour foreshores is always present, and although the sale thereof may be prevented, it is impossible to stop persons casually partaking thereof in spite of repeated warnings.

Tuberculosis.—The number of deaths from all forms of tuberculosis in the metropolis proper during 1926 was, according to the Government Statistician, 568, of which 468 were due to tuberculosis of the lungs, 42 to tubercular meningitis, and 58 to other tubercular diseases. To this must be added 107 deaths of former metropolitan residents, which occurred at Waterfall Sanatorium and other institutions.

The appended table represents, as accurately as possible, the true number of deaths from phthisis, which might be debited to the metropolis proper for each of the past twenty-two years :—

1905...	... 495	1911...	... 541	1917...	... 482	1923...	... 539
1906...	... 498	1912...	... 494	1918...	... 507	1924...	... 584
1907...	... 512	1913...	... 521	1919...	... 654	1025...	... 482
1908...	... 504	1914...	... 601	1920...	... 536	1926...	... 575
1909...	... 458	1915...	... 658	1921...	... 532		
1910...	... 495	1916...	... 623	1922...	... 494		

For the Metropolitan Combined Sanitary Districts, 1,090 cases of pulmonary tuberculosis were notified during 1926, an increase of 49 on the number for the previous year. Of these notified, 679 were males and 411 females; 166 cases were notified from the city proper.

From the Blue Mountains areas there were 115 notifications (75 males and 40 females).

AGE GROUPS.

Table A.

City and Metropolitan Combined Sanitary Districts.

Under 1 year	—	35–44 years	220
1–4 years	2	45–54 ,,	143
5–14 ,,	13	55–64 ,,	78
15–24 ,,	198	65 and over	52
25–34 ,,	276	Ages not stated	99
			1,090

Table B.

Blue Mountain Shire and Katoomba and Blackheath Municipalities.

Under 1 year	—	35–44 years	21
1–4 years	—	45–54	18
5–14 ,,	—	55–64 ,,	4
15–24 ,,	9	65 and over	1
25–34 ,,	38	Ages not stated	24
			115

The home-visiting of notified tubercular patients has been carried out by Nurse-Inspector Fletcher, R.S.I. (Metropolitan Health Officer's Staff), and Nurse-Inspector Blomfield, R.S.I. (Sydney Municipal Council), visiting nurses attached to the Anti-tuberculosis clinics of the Royal Prince Alfred and Royal North Shore Hospital, the Atnti-tuberculosis Dispensary, and the Red Cross Organisation.

Care has been taken to avoid overlapping in home-visiting. During the year 345 disinfections were carried out by local authorities after removal or death of notified cases of pulmonary tuberculosis. There were 152 second notifications. Notices with regard to damp and insanitary dwellings occupied by tubercular patients were served through the local authorities.

Infantile Paralysis.—There were 45 cases recorded in the metropolis, and 4 in the extra metropolitan district during 1926. Of the 49 cases notified for the whole of the metropolitan combined sanitary district 6 proved fatal. (City of Sydney, 1; Canterbury, 1; Petersham, 1; Redfern, 1; St. Peters, 1; and Woollahra, 1). Monthly incidence for the metropolis: January, 23; February, 7; March, 4; April, 4; June, 1; July, 1; October, 1; December, 4. Extra metropolitan districts: January, 2; February, 1; April, 1.

The following is a record of the disease in the metropolis since it was declared notifiable in 1912:—

1912	28 cases notified.		1920	37 cases notified.
1913	32 "		1921	19 "
1914	63 "		1922	12 "
1915	48 "		1923	62 "
1916	186 "		1924	42 "
1917	6 "		1925	38 "
1918	11 "		1926	45 "
1919	8 "			

Epidemic Cerebro-Spinal Fever.—In the metropolis there were 13 cases notified and 9 deaths. The cases were distributed as follow:—City of Sydney, 2; Ashfield, 2; Balmain, 1; Canterbury, 1; Enfield, 1; Glebe, 2; St. Peters, 1; Waterloo, 1; Willoughby, 2. In the extra metropolitan districts there were 3 cases, one each at Bankstown, Liverpool, and Parramatta.

The following is the mortality record in the metropolis:—

1915	43 deaths.		1921	12 deaths.
1916	62 "		1922	7 "
1917	33 "		1923	8 "
1918	25 "		1924	15 "
1919	14 "		1925	8 "
1920	12 "		1926	9 "

Mosquito Extermination.

In March a conference of medical officers and health inspectors was held in the Sydney Town Hall under the presidency first of Alderman Lawes, chairman of the Health Committee of the Municipal Council of Sydney, and later of Dr. Dick, Director-General of Public Health, to discuss measures for a uniform campaign for combating the mosquito nuisance in the metropolitan area.

A severe epidemic of dengue had overrun the towns in the northern portions of the State of New South Wales, and had come even south of Newcastle right through the Hunter River valley. Dengue had also spread inland, for the first time reaching Bourke and Moree (see pp. 99 and 154).

Although there had been no cases in the metropolitan area, the disease had been sufficiently close to justify concern and warrant action against its introduction.

As a result of circulars sent to the local authorities, eighteen of the fifty-six in the metropolitan area had adopted Local Government Ordinance 41 which deals with the mosquito.

It was agreed that in order to combat the mosquito nuisance it was essential first to know the location of breeding areas by having a survey made of the metropolitan area, indicating all collections of stagnant water and other sources of mosquito breeding.

Dr. Dick showed how previous to 1900 the prevalence of rats in the city caused little concern until the outbreak of plague. When it was shown that rats were the cause of loss of life, and that were proper control exercised towards rats, there would be no fear of plague, and the trade and business of the city and the whole State would not be interfered with, the people were then quite willing and anxious to do anything in their power to eliminate the pest. So with mosquitoes.

There had never been a case of dengue recorded as arising in the metropolitan area, although the mosquito, (*Aedes ægypti*), which carries the disease, is found in the district.

Apart, however, from the absence of any actual evidence of communicable disease being carried by mosquitoes, they are sufficiently a nuisance in certain parts of the metropolitan area to justify every effort for their extermination. Especially is this so on the mud flats and mangrove swamps on the Parramatta River. In the Concord area there are 400 acres of these swamps, which are wholesale breeding places for mosquitoes.

There is great need for the reclamation of these swamps to be undertaken, and it is hoped that considerable portions thereof will be converted into playing areas.

Alderman Dr. W. H. Read drew attention to the more or less elevated territory wedged between the Lane Cove River and Middle Harbour, both waterways with a large number of mangrove swamps fed by innumerable creeks in which are stagnant pools.

As there is no drainage or sewerage system in the larger portion of Kuring-gai Shire, most of the houses discharge their waste waters into their grounds, ultimately finding an outlet to creeks and water holes, breeding places for mosquitoes.

So bad had the mosquito pest been that the Killara Community Service Club had made a house-to-house canvas, and ultimately secured the co-operation of the Council in dealing with the roadways and vacant land.

On the 12th August, 1926, a conference of representatives of the local authorities of the metropolitan area met in the Sydney Town Hall under the chairmanship of Alderman Lawes, and after viewing a cinema film, lent by the Public Health Association of Victoria, dealing with malaria and mosquitoes, and a lengthy discussion, passed the following resolutions:—

1. That each municipality have a survey made of all breeding grounds for mosquitoes and endeavour to interest the householders in mitigating the pest by screening all tanks, removing any receptacles containing water, and by oiling.
2. That the Minister for Public Works be urged to secure the commencement at least of the reclamation of mangrove swamps and mud flats on the Parramatta River.
3. That the press be thanked for previous publicity and asked to continue propaganda as to the means of preventing the mosquito pest.

4. That three mayors or aldermen, and three inspectors (to be nominated by the Health Inspectors' Association), and Dr. Purdy, as chairman, be formed into a committee to make recommendations and suggestions.

Alderman Davey, Mayor of Strathfield, Alderman Rothwell, Mayor of Concord, Councillor Dr. W. H. Read of Kuring-gai Shire, Messrs. Bertram Brownell and Nankervis, together with Drs. Ferguson and Stokes, were constituted the committee.

At the first meeting of the committee it was decided to forward a circular letter to each of the local authorities pointing out that it was agreed to tackle the problem of the domestic mosquito, and in addition it would be necessary to see that water-tables are provided in unsewered areas, each householder, as far as practicable, to dispose of his own sewage, and the local inspector be asked to investigate areas where mosquitoes are breeding; that ponds stocked with fish be left alone; and that vegetation around ponds be cleared away and ditches attended to.

The committee met from time to time, and by articles in the press, lectures with cinema films, and radio talks, endeavoured to arouse interest in the subject.

At Willoughby, Strathfield, Randwick, Mosman, Lane Cove special efforts were made to clean ditches and carry out oiling.

Dr. Darnell Smith, Director of the Botanic Gardens, co-operated by having fish placed in the ornamental waters of the Botanic Gardens and in Centennial Park.

Mr. Royce of Dulwich Hill, an enthusiastic naturalist with a private aquarium, presented to the City Council some *Gambusia affinis*, the special mosquito larvæ eating fish which have been so extensively used for keeping down mosquitoes in Italy. After some months Mr. Royce demonstrated that the fish which he had placed in Kippax Lake had thriven and multiplied.

Whilst it was recognised that it was not possible to exterminate the mosquitoes in the metropolitan area, propaganda was the means of inducing many householders to get rid of breeding places around their houses, drains, cisterns, and puddles in their yards. Some of the councils dealt with water holes and ditches.

It is recognised, however, that whilst oiling and ditching are measures suitable for reducing the pest as far as swamps are concerned, reclamation is the only satisfactory means of dealing permanently therewith.

Disposal of Garbage.

The most sanitary method of disposing of household garbage is by incineration. In the metropolis there are ten incinerators or destructors.

In Sydney city proper there are two incinerators dealing with all combustible refuse, including trade and market waste, for a population of 107,000. The first, built at Moore Park in 1901, is a Goddard Massey Warner Top Feed Incinerator, consuming 22,709 tons of garbage annually. The initial cost was £11,372, and the annual working cost, £12,000, includes all charges with repairs.

The second incinerator, built at Pyrmont in 1910, is a Hughes Sterling Front Feed Incinerator. The initial cost was £19,136 (including £3,843 for site) and the annual working cost is £11,300 (including interest on sinking fund and all charges.) Consumes 19,006 tons per annum.

It is proposed to replace these incinerators by one of more modern design.

North Sydney has a Meldrum Simplex Incinerator, built in 1915, and serving a population of 52,000. The initial cost of the plant was £7,000, and the annual working expenditure about £3,687. It disposed of 11,889 loads in 1926.

Newtown also has a Meldrum Simplex, built in 1922, serving the population of Redfern and Newtown, over 57,000. The initial cost was £12,260 (£1,200 being for land), and the annual expenditure was £2,910.

Marrickville has a Meldrum, built in 1914, which serves Marrickville and Petersham, with a population of over 72,000. The initial cost was £9,650 (including a stone-crushing plant), and the annual cost was £3,666. This destructor is in a well-populated area, just at the rear of the Town Hall, and there is no nuisance.

Leichhardt has a two-cell Meldrum type, built in 1901, consuming about 3,221 tons per annum.

Manly has a small Hughes Sterling Incinerator, built in 1914, burning 3,656 tons per annum. The initial cost was £4,047, and the annual expenditure £3,613.

Paddington has an Armstrong and Holland Destructor, which takes the refuse of Waverley as well as Paddington.

Balmain has a destructor at the electric light works.

Outside of the above areas, the garbage is disposed of by the primitive method of tipping. In certain districts, such as Randwick and Willoughby, where there has been considerable nuisance from the tipping of garbage, the provision of destructors has been held up owing to failure to secure a site.

Woollahra has recently built a Meldrum Destructor, but this is not yet working.

The conditions in some suburbs where tips are still the vogue are not creditable in a large modern city like Sydney.

The alternative to tipping, disposal at sea, has not proved satisfactory owing to refuse at certain seasons and tides being washed on to the beaches.

The failure of local authorities to provide modern incinerators and the consequent retention of refuse tips means that there are certain areas where rats are freely bred and where flies are in the summer a constant source of annoyance.

STABLES.

There is still evidence of laxity with regard to seeing that Local Government Ordinance 39 dealing with horses and stables is strictly enforced.

The provision requiring the owner of any stable or horse-yard to cause the same to be sufficiently paved and drained and for the occupier to provide and keep covered an impervious manure bin, which must be emptied and cleansed at least once a week, is sometimes more honoured in the breach than the observance.

The attention of local authorities has been directed to the importance of enforcing this ordinance as also that prescribing that horses shall not be kept nearer than 30 feet from any dwelling.

REGULATION OF BARBERS' SHOPS.

Local Government Ordinance 62, first adopted by the municipality of Katoomba, has now been applied to most of the municipalities in the metropolitan area. Under this ordinance, by which the premises are licensed, provision is made for an adequate supply of hot and cold water, the general cleanliness of the shop, the sterilisation of instruments, and the general conduct of the business.

In the city of Sydney a special by-law under the City of Sydney Corporation Amendment Act, 1924, was gazetted on the 13th August, 1926.

During the first six months 417 applications were made for registration, of which 38 were refused, owing to unsuitability of premises, or unsatisfactory arrangements for disinfecting utensils.

COMMON LODGING HOUSES.

As showing the change during the past quarter century in the housing of persons in common lodging houses in the city, where people are lodged for a single night, or for less than a week at a time, whereas in 1902 there were 290 common lodging houses registered, housing 5,154 persons, in 1926 there were only 16 registered, accommodating 855 persons.

The number of rooms in 1902 was 1,968; in 1926 there were 309. In the intervening period many premises had been condemned and demolished.

The largest common lodging house has 10 dormitories, accommodating 295 persons; the smallest, five rooms, accommodating 15 persons.

These lodging houses are inspected regularly, and it is now rare to find a breach of the regulations.

RESTAURANTS, TEA ROOMS, &c.

In the city there is strict supervision over the 247 restaurants, 50 grill rooms, 194 tea rooms, 185 fruit shops, 58 fish shops, and 66 sundae shops, as well as the 261 butchers' shops, bacon stores, and small goods shops.

Seventy five restaurant premises were closed between 1920 and 1924. The general standard of restaurants has been much improved. New by-laws have been drafted for the licensing, control and regulation of restaurants, but have not yet been gazetted.

RATS.

The last case of bubonic plague recorded in Sydney was on 30th June, 1923. In 1921–1922 there was an outbreak of 35 cases, with ten deaths, from 29th November, 1921, to 9th June, 1922. In all, during that period 151 infected rodents were found, the last on 13th July, 1922.

Continually in the city proper eight ratcatchers are employed trapping and poisoning rats. In all, 14,852 premises were visited by the ratcatchers, 58,068 traps were set and 39,780 poison baits laid. 4,334 rats were caught. There were 13 *Mus rattus* male and 2 female, 2,097 *Mus norvegicus* male and 2,222 female.

The rats caught are taken to the microbiological laboratory of the Department of Public Health for examination.

The Harbour Trust employs four ratcatchers working under Chief Inspector Juleff in trapping and poisoning rats around Darling Harbour foreshores.

The Railway authorities also co-operate with the City Council staff, more especially with regard to the protection from Darling Harbour station.

Mr. Vogwell, Chief Health Inspector of the city, arranges for the ratcatchers to work in special areas, and for the health inspectors in their routine house-to-house inspection to note any rat runs, and immediately communicate with the rat officers.

As the result of experience in the last outbreak of plague, care is taken to keep W.C. cisterns covered and otherwise cut off the access of rats to water.

LEGAL PROCEEDINGS TAKEN BY LOCAL AUTHORITIES.

TABLE 10.—Legal proceedings taken by local authorities during the year 1926 in respect of matters affecting public health:—

Metropolis—Name of Municipalities.	Public Health Acts.	Noxious Trades Act.	Local Government Ordinances.	Convictions obtained.	Cases dismissed.	Cases withdrawn.	Total cases.
Alexandria	2	1	12	14	...	1	15
Balmain	3	...	7	10	...	...	10
Bexley	...	3	...	3	...	...	3
Burwood	1	...	3	3	...	1	4
Canterbury	...	...	1	1	...	...	1
Darlington	...	...	1	1	...	...	1
Enfield	...	...	1	1	...	...	1
Glebe	...	...	3	1	1	1	3
Hunter's Hill	...	...	3	2	...	1	3
Hurstville	1	...	...	1	...	...	1
Kogarah	...	...	2	2	...	...	2
Lane Cove	4	...	2	2	...	4	6
Leichhardt	...	...	3	3	...	...	3
Manly	2	...	7	6	1	2	9
Mosman	...	...	3	2	1	...	3
Mascot	...	...	1	1	...	...	1
North Sydney	9	...	15	13	...	11	24
Paddington	...	...	4	4	...	...	4
Randwick	...	...	6	6	...	...	6
Redfern	...	...	3	3	...	...	3
Rockdale	...	...	2	2	...	...	2
Ryde	...	...	2	2	...	...	2
Waterloo	4	1	1	6	...	...	6
Waverley	...	...	8	8	...	...	8
Willoughby	...	...	2	1	...	1	2
Woollahra	...	...	4	3	...	1	4
Ku-ring-gai Shire	1	1	10	12	...	...	12
EXTRA METROPOLITAN.							
Hornsby Shire	...	...	3	3	...	...	3
Parramatta	...	...	2	1	1	...	2
Prospect and Sherwood	...	...	2	2	...	...	2
Warringah Shire	...	...	3	3	...	...	3

INSPECTION OF RESTAURANTS, TEAROOMS, BUTCHERS' SHOPS, MILK VENDORS, COMMON LODGING-HOUSES, BARBERS' SHOPS, &C., IN THE CITY.

In connection with the general administration of the City Health Officer's Department, it may be stated that there are 20,109 premises, 247 restaurants, 194 tearooms, 50 grill-rooms, 950 milk vendors, 185 fruit shops, 58 fish shops, 89 butchers' shops, and 417 barbers' shops in the city.

The following is a summary of the routine work during the year:—

1.	Number of complaints received and dealt with	1,220
2.	House-to-house inspection work, re-inspections, inspections *re* restaurants, garbage receptacles, streets, lanes, &c.	38,560
3.	Inspections of butcheries, meat depots, poulterers, &c.	10,096
4.	Inspections made under Pure Food Act Regulations	11,139
5.	Inspections of common lodging-houses	73
6.	Inspections under Dairies Supervision Act	2,781
7.	Investigations of smoke nuisance	170
8.	Inspections made by lady inspector	1,537
9.	Investigations of infectious diseases	157
10.	Notices served	4,207
11.	Number of premises referred to the City Building Surveyor	416
12.	Plans reported on	1,007
13.	Number of premises visited by rat-catching staff	14,852
14.	Number of complaints investigated by rat-catchers	460
15.	Number of traps set and poison baits laid	97,848
16.	Number of rats caught	4,334
17.	Number of milk vendors registered	1,136
18.	Number of milk samples taken for analysis	1,000
19.	Disinfection of premises	377
20.	Prosecutions against offenders	405
21.	Total amount of fines inflicted	£549 10s. 6d.

LEGAL PROCEEDINGS, SYDNEY MUNICIPAL COUNCIL.

The following is a record for the year 1926, with regard to legal proceedings undertaken by the Sydney Municipal Council:—

Sydney Corporation Act and By-laws	313
Public Health Act...	12
Pure Food Act	44
Police Offences Act	28

One hundred and forty-three (143) notices were served in the city proper under the Pure Food Act; 1,007 plans were inspected, and reports made thereon by the City Health Officer's staff.

In all, there were 4,207 notices served in the city under the Public Health Act, the Sydney Corporation Act, the Pure Food Act, the Dairies Supervision Act, and the Noxious Trades Act.

Of the 1,087 samples of milk taken in the city, sixteen were found not in conformity with the standard. There were five (5) convictions for selling milk deficient in milk fat.

SEPTIC TANKS.

Two hundred and four septic tanks were constructed during 1926; and 139 sites were considered unsuitable after inspection. Only two nuisances due to septic tanks were reported. Septic tanks designed at the request of the Warringah Shire Council were installed on 24 beaches north of Manly.

I am, &c.,
J. S. PURDY,
Metropolitan Medical Officer of Health.

TABLE 12.—Principal Causes of Death in

Year 1926.	Age Groups											Municipaliti																					
Causes of Death.	Under 1 year.	1—4 years.	5—14 years.	15—24 years.	25—34 years.	35—44 years.	45—54 years.	55—64 years.	65 and Over.	Age not stated.	Total.	City of Sydney.	Alexandria.	Annandale.	Ashfield.	Balmain.	Bexley.	Botany.	Burwood.	Canterbury.	Concord.	Darlington.	Drummoyne.	Eastwood.	Enfield.	Erskineville.	Glebe.	Homebush.	Hunter's Hill.	Hurstville.	Kogarah.	Lane Cove.	Leichhardt.
Typhoid Fever	...	...	2	3	5	5	3	2	2	...	22	7	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...
Measles	8	22	7	...	1	1	1	...	...	...	40	5	1	1	1	...	1	1	...	6	...	...	1	...	1	...	3	...	...	...	1	...	1
Scarlet Fever	2	18	11	1	3	2	1	...	...	...	38	5	...	...	1	1	...	...	...	4	...	...	...	...	...	...	...	...	...	2	1	...	1
Whooping Cough	37	31	2	...	...	...	...	...	...	...	70	13	1	2	2	2	2	1	2	5	2	...	1	...	...	2	2	...	...	1	1	...	3
Diphtheria	10	32	15	...	...	...	...	...	...	...	57	3	...	1	4	3	...	...	3	3	...	...	2	...	...	...	1	1	...	...	2	...	2
Influenza with Pulmonary Complications.	2	2	1	7	6	6	7	12	39	...	82	6	1	1	4	...	...	...	3	3	1	...	1	...	1	...	2	1	1	3	1	2	3
Influenza—other	3	2	...	4	2	3	5	9	29	...	57	11	...	...	...	2	1	...	2	2	4	...	2	...	1	1	...	...	...	...	3	...	1
Erysipelas	4	1	...	...	1	2	2	2	4	...	16	...	1	...	2	1	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Infantile Paralysis	3	2	...	...	...	...	1	...	...	...	6	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Lethargic Encephalitis	...	1	1	2	4	4	1	6	1	...	20	...	1	...	2	...	...	...	...	2	1	1	...	...	...	1	1	...	...	...	...	1	...
Epidemic Cerebro-Spinal Meningitis.	5	3	...	...	...	...	1	...	...	...	9	...	...	...	1	1	...	...	...	...	1	...	...	...	...	...	1	...	...	...	1	...	1
Other Epidemic Diseases	4	1	1	...	3	...	4	5	6	...	24	1	...	...	...	2	1	...	...	2	...	...	...	...	1	...	1	...	4	...	...	...	1
Tuberculosis of Respiratory System.	1	3	3	57	195	128	79	63	45	1	575	147	4	4	19	17	9	1	9	21	5	2	2	5	3	2	11	7	5	12	9	2	19
Tuberculosis—Meninges, &c.	4	15	6	1	5	2	...	...	1	...	34	5	...	...	...	2	...	...	...	1	1	...	1	...	...	1	1	...	1	...	...	1	2
Other Tuberculosis Diseases	2	6	6	5	7	9	7	4	2	...	48	6	...	...	2	2	...	...	1	3	1	...	1	...	2	...	1	1	...	...	...	...	...
Cancer	...	2	3	3	19	84	164	294	483	...	1,052	12	11	21	34	83	31	79	17	43	14	3	13	4	12	4	26	4	8	16	18	15	43
Diabetes	...	...	2	3	5	6	21	38	59	...	134	20	...	1	11	4	2	1	1	4	2	...	4	1	...	1	2	...	2	1	2	1	5
Other General Diseases	26	12	31	18	28	46	55	59	69	...	344	49	1	8	16	7	5	1	6	21	3	...	9	2	3	6	4	1	5	3	9	1	14
Meningitis	15	19	8	9	9	9	5	9	3	...	86	10	...	...	2	4	...	1	...	5	...	...	1	...	...	1	2	...	1	1	...	2	4
Cerebral Hæmorrhage	1	...	1	1	5	22	50	120	323	...	523	57	6	7	24	27	2	4	11	19	7	2	12	3	10	4	9	3	8	7	9	5	16
Convulsions of Infants	25	3	...	...	...	...	...	...	...	...	28	3	...	1	1	2	...	1	...	2	...	...	...	...	...	...	...	...	...	...	1	...	...
Other Diseases of Nervous System.	8	7	18	12	26	67	45	70	160	...	413	43	4	6	14	16	2	4	9	15	6	1	5	4	2	4	9	2	17	4	6	7	16
Diseases of the Heart	2	3	11	20	39	104	150	319	930	1	1,579	202	14	24	67	58	21	5	24	63	14	11	35	6	18	4	28	6	27	28	32	11	55
Other Diseases of the Circulatory System.	3	...	...	...	5	17	37	43	117	...	222	39	2	1	12	11	1	5	4	6	2	2	3	1	4	...	5	1	3	5	4	4	3
Bronchitis	10	2	...	2	4	6	8	11	117	...	160	24	4	2	8	4	1	...	2	12	...	...	8	2	...	4	1	2	...	5	1	...	5
Pneumonia	97	96	24	32	43	76	85	91	244	1	789	108	15	12	33	49	7	9	11	31	8	4	12	...	16	10	20	3	8	24	15	6	32
Other Diseases of Respiratory System.	1	8	4	7	8	13	16	14	42	...	113	16	...	3	6	7	4	1	2	5	3	...	3	1	...	3	3	1	1	1	4	...	3
Diseases of the Stomach	6	1	...	1	5	8	20	9	26	...	76	11	...	1	2	4	...	...	4	2	1	...	...	...	...	...	1	...	...	...	1	1	3
Diarrhœa and Enteritis	248	70	2	1	4	2	7	8	55	...	397	32	9	2	28	11	9	9	13	28	5	2	6	1	5	8	10	2	9	14	12	1	10
Appendicitis	...	1	4	10	14	17	15	17	10	...	88	13	...	...	2	3	1	1	1	1	3	...	3	...	3	...	...	...	2	2	2	...	1
Hernia-Intestinal Obstruction	15	5	2	5	1	7	10	15	37	...	97	13	...	1	6	3	1	...	3	7	...	...	3	1	1	...	1	...	1	2	3	...	3
Cirrhosis of Liver	...	...	...	1	3	10	16	27	17	...	74	13	...	4	1	2	...	...	...	3	...	...	...	...	...	...	1	...	1	1	2	...	2
Peritonitis	1	2	3	2	2	7	...	2	4	...	23	4	...	...	...	...	...	1	...	2	...	1	...	...	...	...	1	...	...	...	1	...	2
Other Diseases of Digestive System.	2	3	6	5	15	17	17	36	29	...	130	18	3	3	6	3	2	1	3	8	...	1	7	1	3	1	1	...	1	5	1	2	3
Bright's Disease, Acute and Chronic.	1	...	9	15	30	58	85	85	230	...	513	62	7	9	19	21	14	3	5	12	6	3	9	1	4	1	17	1	5	16	11	2	17
Other Genito-Urinary Diseases	2	2	1	5	9	18	17	40	88	...	182	29	3	1	8	9	1	2	3	6	1	...	1	...	3	...	2	...	3	3	3	3	6
Puerperal Septicæmia	...	...	...	6	12	8	...	...	...	...	26	3	...	...	...	...	2	...	...	2	...	1	...	...	1	...	...	1	1	3	1	1	...
Other Puerperal Diseases	...	...	...	26	41	28	5	...	...	...	100	9	1	2	3	...	...	...	1	6	2	...	2	1	3	3	3	1	1	1	3	2	2
Prematurity	386	...	...	...	...	...	...	...	...	...	386	66	2	5	7	7	9	3	8	17	6	...	9	3	6	...	8	1	...	8	9	8	10
Other Developmental Diseases of Infants.	287	3	1	...	...	...	...	...	...	...	291	40	3	5	11	8	3	...	7	17	1	...	6	2	6	4	4	...	2	4	5	3	7
Senility	...	...	...	...	...	...	1	6	398	...	405	86	6	5	16	10	1	1	19	16	3	3	7	2	2	1	10	3	5	5	5	4	3
Suicide	...	...	1	8	30	37	27	18	10	...	131	26	4	3	2	6	2	...	...	2	...	1	1	1	2	...	2	...	2	...	6	...	4
Accident	7	29	57	54	51	65	56	53	80	...	452	99	5	4	7	16	3	7	3	12	3	1	4	1	6	3	14	3	2	13	12	4	12
All other Causes	15	7	10	6	14	20	16	15	41	...	144	29	4	3	3	5	3	...	1	9	1	...	2	...	...	3	4	1	3	2	2	...	3
Totals	1,243	414	253	332	654	914	1,040	1,502	3,701	3	10056	1455	114	136	401	364	127	72	178	433	107	39	176	43	119	72	212	46	129	193	200	89	318
Deaths under 1 year	...	...	...	...	...	...	...	...	...	...	1,243	154	16	17	55	38	18	8	33	82	12	2	22	5	24	20	30	3	8	30	31	13	33

ach Municipality and in Age Groups, year 1926.

ith'n Metropolis.																				Extra Metropolitan Municipalities.											Shires.			
Manly.	Marrickville.	Mascot.	Mosman.	Newtown.	North Sydney.	Paddington.	Petersham.	Randwick.	Redfern.	Rockdale.	Ryde.	St. Peters.	Strathfield.	Vaucluse.	Waterloo.	Waverley.	Willoughby.	Woollahra.	Kuring-gai Shire.	Auburn.	Bankstown.	Cabramatta and Canley Vale.	Dundas.	Ermington and Rydalmere.	Fairfield.	Granville.	Ingleburn.	Lidcombe.	Liverpool.	Parramatta.	Prospect and Sherwood.	Hornsby Shire.	Warringah Shire.	Causes of Death.
3	...	1	...	2	...	...	...	1	...	1	...	...	1	...	...	1	...	...	1	...	...	...	...	...	...	...	...	1	1	1	...	...	...	Typhoid Fever.
1	...	...	...	1	2	...	1	...	3	1	1	...	...	...	1	2	2	2	...	1	...	...	...	...	...	1	...	...	...	...	...	2	...	Measles.
...	3	2	1	...	1	1	1	...	2	1	2	1	2	...	1	3	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	Scarlet Fever.
...	4	...	1	2	2	2	...	...	7	1	2	...	...	...	3	1	...	2	1	1	...	...	...	...	...	...	...	2	...	...	...	...	...	Whooping Cough.
...	...	...	...	2	3	2	...	7	3	...	...	2	1	...	2	1	8	...	1	...	...	...	...	...	...	2	...	...	2	1	...	...	...	Diphtheria.
1	1	2	4	2	8	2	2	3	1	3	...	...	1	2	...	8	...	4	4	1	1	...	...	...	1	2	5	2	6	3	...	3	2	Influenza with Pulmonary Complications.
1	2	...	...	...	3	3	1	6	2	...	...	1	2	...	1	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Influenza—other.
1	2	...	...	...	2	...	...	1	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	Erysipelas.
...	...	...	...	...	...	...	1	...	1	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Infantile Paralysis.
1	1	...	1	1	1	...	1	...	...	1	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	1	...	...	...	...	1	...	Lethargic Encephalitis.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	Epidemic Cerebro-Spinal Meningitis.
...	...	...	1	...	1	...	...	1	...	3	1	...	...	1	...	...	...	2	1	...	...	...	...	6	...	1	...	...	1	...	...	...	...	Other Epidemic Diseases.
7	15	5	6	21	21	16	16	28	8	11	11	6	6	4	8	23	16	19	13	6	7	...	2	8	2	5	25	3	19	8	1	29	3	Tuberculosis of Respiratory System.
...	...	...	...	3	3	1	...	3	...	2	...	1	...	1	...	1	2	1	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	Tuberculosis—Meninges, &c.
...	2	...	1	3	1	...	2	2	4	2	2	1	...	...	2	...	1	2	3	...	1	...	...	...	...	1	1	1	1	...	...	...	...	Other Tuberculosis Diseases.
27	45	12	26	35	55	29	28	47	26	29	50	11	9	6	9	45	20	27	23	16	7	2	3	2	2	9	39	54	21	5	1	11	6	Cancer.
3	8	2	3	2	7	5	2	4	1	2	2	2	1	1	1	13	5	3	2	3	1	...	...	...	...	...	4	...	1	...	...	2	1	Diabetes.
5	12	4	9	11	15	15	6	18	11	8	7	3	...	...	3	20	6	9	8	12	...	1	2	8	1	2	12	3	8	1	1	7	2	Other General Diseases.
3	2	1	5	3	4	1	3	6	3	1	6	...	1	...	1	6	5	1	...	...	...	...	...	...	...	3	2	...	1	...	...	...	...	Meningitis.
12	21	...	12	19	27	21	26	24	5	10	5	6	6	2	9	31	17	12	6	4	3	1	...	3	1	8	30	5	12	6	1	11	6	Cerebral Hæmorrhage.
1	1	...	...	...	3	2	1	1	1	2	...	...	1	...	...	2	...	2	...	1	1	...	...	...	...	...	1	...	...	...	...	1	...	Convulsions of Infants.
11	20	4	13	16	22	13	10	19	10	5	4	2	3	3	7	15	16	16	8	7	1	1	...	20	2	2	22	7	10	2	...	8	2	Other Diseases of Nervous System.
39	62	10	37	63	91	51	40	84	42	33	28	17	11	6	13	72	58	35	34	20	6	1	4	36	8	12	107	26	53	19	1	24	11	Diseases of the Heart.
5	12	6	2	8	10	9	1	7	6	3	4	1	1	2	4	8	4	5	6	4	1	1	1	8	...	3	14	...	8	1	...	1	5	Other Diseases of Circulatory System.
2	8	4	3	8	7	4	4	3	4	4	2	4	...	...	3	4	7	1	3	2	4	...	2	...	1	1	17	4	14	...	...	3	...	Bronchitis.
12	32	5	11	32	35	21	14	37	23	19	15	13	1	2	7	26	14	27	10	22	7	3	...	10	4	10	18	3	14	...6	...	10	3	Pneumonia.
2	4	...	...	3	5	2	4	4	3	3	1	1	4	...	1	1	5	2	1	2	1	...	1	...	...	2	12	...	...	1	...	4	...	Other Diseases of Respiratory System.
2	1	1	3	4	4	3	4	6	2	5	1	...	1	...	...	1	3	3	1	5	...	...	...	...	1	1	4	1	...	1	...	2	...	Diseases of the Stomach.
11	13	7	5	11	11	8	7	12	14	7	8	7	2	2	14	15	8	3	6	8	5	...	3	3	2	4	32	7	9	2	...	4	2	Diarrhœa and Enteritis.
...	3	1	3	...	4	1	6	4	6	3	...	1	1	1	2	3	1	4	6	3	...	...	...	...	1	...	...	...	1	...	...	1	...	Appendicitis.
2	3	1	1	4	4	2	5	4	2	1	3	3	1	1	2	3	3	1	2	4	...	...	...	...	...	1	4	...	...	1	...	...	...	Hernia-Intestinal Obstruction.
4	2	...	...	3	5	3	2	5	1	1	2	...	...	...	...	5	5	6	...	...	1	...	...	1	...	...	3	1	2	...	...	...	...	Cirrhosis of Liver.
...	...	...	...	...	2	...	...	...	...	2	1	...	1	...	...	3	...	1	1	1	...	...	1	...	...	1	1	...	...	...	...	...	...	Peritonitis.
1	3	1	1	1	6	2	2	6	2	6	2	...	1	...	1	6	8	4	4	4	...	1	...	...	1	2	...	...	5	...	...	2	1	Other Diseases of Digestive System.
14	19	10	12	8	26	13	16	34	17	12	5	6	4	3	6	27	17	14	5	18	3	...	...	1	...	10	32	4	15	4	1	3	3	Bright's Disease, Acute and Chronic.
4	9	2	8	5	5	3	4	13	5	5	1	1	2	2	3	12	6	2	3	1	...	...	...	2	...	2	24	5	3	...	...	1	...	Other Genito-Urinary Diseases.
2	...	1	...	...	3	1	1	...	...	1	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	Puerperal Septicæmia.
2	4	...	...	2	3	3	3	6	7	2	...	3	...	2	2	4	6	4	1	4	...	...	...	...	...	...	...	1	2	...	...	...	...	Other Puerperal Diseases.
3	17	3	2	8	16	57	6	15	5	7	7	3	3	...	4	12	13	6	7	8	4	1	1	...	1	7	2	4	5	1	...	7	1	Prematurity.
3	13	1	3	7	13	25	8	10	7	12	4	3	3	1	1	15	14	4	6	2	7	1	...	1	...	4	1	...	6	4	...	3	3	Other Developmental Diseases of Infants.
5	18	6	5	9	22	15	8	21	15	4	5	3	3	6	5	18	13	7	4	5	7	2	1	3	3	5	85	14	24	2	2	3	5	Senility.
3	6	...	4	4	6	4	4	9	4	4	1	...	1	1	1	6	5	2	2	2	2	1	1	1	...	...	2	...	3	1	...	3	2	Suicide.
8	18	4	11	17	10	16	10	17	14	19	8	6	1	2	12	16	9	9	11	21	3	3	1	1	...	3	9	6	18	1	...	6	11	Accident.
4	6	2	7	5	4	4	3	6	1	5	...	2	1	...	...	5	5	1	5	...	1	...	...	4	1	...	20	2	2	...	1	1	1	All other Causes.
205	392	98	201	325	473	360	253	474	268	241	191	111	77	51	131	437	305	250	190	189	74	19	23	118	32	105	532	156	269	71	9	154	70	Totals.
14	49	9	9	39	47	99	24	44	33	33	18	16	8	3	22	49	36	19	18	22	20	4	1	1	3	18	12	6	20	5	...	10	6	Deaths under 1 year.

All deaths in institutions have been corrected to municipality of previous residence where known.

2.—Hunter River Combined Sanitary District.

Staff.

H. G. Wallace, M.B., B.S., D.P.H. (Melb.), Medical Officer of Health.
George H. Godfrey, Assoc. Roy. San. Inst. (Lond.), Senior Sanitary Inspector.
Nancy B. McKay, Cert. Roy. San. Inst. (Lond.), Nurse Inspector.
Beatrice M. Durie, Clerk.

REPORT OF THE MEDICAL OFFICER OF HEALTH FOR YEAR 1926.

I have the honor to submit the following report of the Public Health work done in this district during the year 1926:—

Description.—The Hunter River Combined Sanitary District consists of eighteen (18) municipalities and five (5) shires, together with the harbour of Port Hunter. The total area of the district, exclusive of Port Hunter, is 1,768 square miles, outlying parts of the district extending up to 70 miles from Newcastle. From time to time on instruction from Head Office, Sydney, the staff is required to carry out duties in areas beyond the boundaries of the district.

Population.—The estimated mean population of the district in 1926 was 191,780, an increase of 4,990 compared with that in 1925. The inhabitants are chiefly engaged in industrial, coal-mining, and pastoral occupations.

Administration.—The staff of the District Head-quarters at Newcastle consists of one Medical Officer of Health, one Senior Sanitary Inspector, one Nurse Inspector and one Clerk. Each municipality and shire council in the district is a local health authority charged with the administration of the Public Health Acts, and each employs one or more health inspectors. Many of these officers possess no certificate of special training in health work, and moreover a number of them, in addition to their duties as health inspectors, carry out the duties of one or more other positions, such as town clerk, engineer, working foreman, traffic inspector, &c. In consequence, some health activities, especially housing inspections and inspections under the Pure Food Act, are liable to be overshadowed by other duties, and part of this work is carried out by officers of the Department of Public Health.

Vital Statistics.—Figures showing the population of each municipality and shire, together with the chief causes of deaths at all ages, and of infants under 1 year of age, are set out in the tables appended to this report. The figures for Kearsley Shire and the Municipality of Cessnock are grouped under the heading "Cessnock Shire," as these areas were formed during the year from what was formerly known as Cessnock Shire.

The total births in the district numbered 5,209, giving a crude birth-rate of 27·16 compared with 22·88 for the State of New South Wales.

The deaths from all causes numbered 1,789, giving a death-rate of 9·32 compared with 9·56 for the whole State.

Infectious Diseases.—The following tables show the distribution of infectious diseases in the district during 1926:—

Typhoid Fever, 1926.

Table I.—Showing distribution of cases of Typhoid Fever in the Hunter River Combined Sanitary District, the number treated in hospital, and the attack and death rates per thousand of the population during the year 1926—76 cases, ; 9 deaths.

District.	Estimated Population.	Cases notified.	Removed to Hospital.	Attack-rate per 1,000.	Death-rate per 1,000.
Municipalities—					
Adamstown	4,540	2	......	·44	......
Carrington	3,120	3	3	·96	......
Greta	1,590	......	......	......	......
Hamilton	17,400	1	1	·05	......
Lambton	4,130	1	1	·24	......
Maitland East	3,910	13	11	3·32	......
Maitland West	8,920	1	1	·11	......
Merewether	7,710	4	4	·51	......
Morpeth	1,070	1	1	·93	......
Newcastle	15,190	5	5	·13	·19
New Lambton	5,080	3	3	·59	......
Raymond Terrace	830	......	......	......	......
Singleton	3,280	1	1	·30	......
Stockton	5,380	5	4	·92	......
Wallsend	7,130	2	2	·28	·56
Waratah	16,040	1	1	·06	......
Wickham	13,130	2	2	·15	......
Shires—					
Bolwarra	3,310	1	1	·30	......
Cessnock	37,010	13	13	·35	.02
Lake Macquarie	23,200	10	9	·43	......
Port Stephens	3,850	1	1	·27	......
Tarro	5,960	6	5	1·00	·17
Total	191,780	76	69	·39	·04

Of the 76 cases of typhoid fever notified, 69 were treated in hospital. The incidence rate per 1,000 of population was ·39. The average number of notifications per year during the previous five years was 91.

House Incidence.—Sixty houses had one case each. In four instances there were 2 cases, and in one instance 3 cases from the same house. In one instance 5 cases occurred in the same house.

Age Incidence was as follows :—

Age.	Cases.		Total.
	M.	F.	
1- 4	3	2	5
5–14	15	5	20
15–24	14	13	27
25–34	4	3	7
35–44	10	1	11
45–54	2	3	5
55–65	1	...	1
65 and over	...	...	...
Totals	49	27	76

Deaths from Typhoid.—There were 9 deaths from typhoid fever during 1926, giving a death-rate of ·046 per thousand of population, compared with 0·03 for the whole State. The three highest incidence rates were in February, March and December.

DIPHTHERIA, 1926.

TABLE 2.—Showing distribution cases of Diphtheria occurring in the Hunter River Combined Sanitary District, number treated in hospital, and attack and death rates per 1,000 of the population during the year 1926—379 cases, 15 deaths :—

District.	Estimated Population.	Cases notified.	Removed to Hospital.	Attack-rate per 1,000.	Death-rate per 1,000.
Municipalities—					
Adamstown	4,540	14	14	3·09	......
Carrington	3,120	5	5	1·60	......
Greta	1,590	......	......	......	......
Hamilton	17,400	28	28	1·60	......
Lambton	4,130	9	9	2·17	......
Maitland East	3,910	14	12	3·58	......
Maitland West	8,920	9	6	1·00	·11
Merewether	7,710	18	17	2·33	......
Morpeth	1,070	......	......	......	......
Newcastle	15,190	21	18	1·38	·59
New Lambton	5,080	14	14	2·75	......
Raymond Terrace	830	1	......	1,20	......
Singleton	3,280	12	8	.36	......
Stockton	5,380	27	16	5·02	......
Wallsend	7,130	6	3	·84	......
Waratah	16,040	40	36	2·49	·05
Wickham	13,130	26	25	1·98	......
Shires—					
Bolwarra	3,310	2	2	·60	......
Cessnock	37,010	84	66	2·27	·02
Lake Macquarie	23,200	38	34	1·63	......
Port Stephens	3,850	......	......	......	......
Tarro	5,960	11	11	1·84	·05
Total	191,780	379	324	1·97	·07

Three hundred and seventy-nine cases of diphtheria, with 15 deaths, were notified during the year. The disease was widely distributed, only two municipalities and one shire remaining free. The average number of cases notified annually during the previous five years was 366. The incidence rate per thousand of population was 1·9. The death rate per thousand of population was 0·07 compared with 0·06 for the whole State. The fatality rate was 3·95 per cent.

House Incidence.—354 houses had 1 case each; 11 had 2 cases, and one had 3 cases each. Of the total number attacked 164, or 43 per cent., attended schools, whilst 50 per cent. were under 5 years of age. 85 per cent. of the cases were removed to hospital for treatment.

Schick Test.—At Awaba, in Lake Macquarie Shire, the Schick Test was applied to 61 children. Of these 28, or 45 per cent., showed a positive reaction.

Arrangements were made towards the close of the year to continue the work of testing and immunising children against diphtheria at Cessnock. In this connection a great deal of publicity is required to overcome prejudice on the part of the parents. Cinematograph films, public lectures and newspaper articles on the subject of diphtheria and its prevention might be made an activity of a special branch of the department dealing with publicity, as is now the custom in many other parts of the world.

SCARLET FEVER.

Three hundred and nine cases of scarlet fever were notified with no deaths. The average number of annual notifications during the previous five years was 213. The disease therefore showed an unusually high prevalence, but fortunately was of a mild type. There was no reason to suspect the milk supply in any case as being responsible for the spread of the disease.

House and School Incidence.—In 271 cases there was only 1 patient per house, in 16 cases 2 from the same house, and 3 cases occurred in two instances in the same house; 64 per cent. of the notified cases were children attending school.

The incidence rate per thousand of population was 1·61 compared with 0·02 for the whole State.

Dick Tests.—A supply of toxin from a strain of *Streptococcus scarlatinæ* isolated in Melbourne was made available towards the end of the year. Advantage of this was taken to test 227 patients at the Newcastle Mental Hospital, of whom 87, or 38·3 per cent., showed a positive reaction.

TABLE 3.—Showing distribution of cases of Scarlet Fever in the Hunter River Combined Sanitary District, the number treated in hospital, and the attack and death rates per 1,000 of the population, during the year 1926 : 309 cases, 0 deaths.

District.	Estimated Population.	Cases notified.	Removed to Hospital.	Attack-rate per 1,000.	Death-rate per 1,000.
Municipalities—					
Adamstown	4,540	1	......	·22	......
Carrington	3,120	5	1	1·59	......
Greta	1,590	......	......	......	......
Hamilton	17,400	30	3	1·72	......
Lambton	4,130	6	3	1·45	......
Maitland East	3,910	4	3	1·02	......
Maitland West	8,920	2	1	·22	......
Merewether	7,710	10	......	1·28	......
Morpeth	1,070	......	......	......	......
Newcastle	15,190	22	19	1·44	......
New Lambton	5,080	12	2	·23	......
Raymond Terrace	830	1	......	1·20	......
Singleton	3,280	5	1	1·52	......
Stockton	5,380	5	1	·92	......
Wallsend	7,130	9	2	·93	......
Waratah	16,040	29	6	1·88	......
Wickham	13,130	6	......	·45	......
Shires—					
Bolwarra	3,310	3	......	·90	......
Cessnock	37,010	85	25	2·29	......
Lake Macquarie	23,200	55	11	2·37	......
Port Stephens	3,850	1	1	·26	......
Tarro	5,960	18	9	3·02	......
Total	191,780	309	88	1·61	

INFANTILE PARALYSIS.

During the year 8 cases of infantile paralysis occurred, with no deaths. The distribution and age groups are shown in table below. The incidence rate per thousand of population was 0·04 compared with 0·01 for the whole State.

Age.	Cases.		Total.
	M.	F.	
1–4 years	3	2	5
5–14 ,,	2	1	3
Total	5	3	8

CEREBRO-SPINAL MENINGITIS.

Three cases of meningococcal meningitis occurred during the year, with one death, as shown in table below. Incidence rate per thousand of population was 0·02 compared with 0·01 for whole State.

Age.	Cases.		Total.
	M.	F.	
1–4	1	...	1
5–14	1	...	1
15–24	...	...	...
25–34	...	1	1
Total	2	1	3

PULMONARY TUBERCULOSIS.

Sixty cases of pulmonary tuberculosis were notified during 1926, compared with 61 in 1925 and 62 the yearly average for the previous five years. There were 61 deaths. A number of cases referred to me by medical practitioners were examined and arrangements made for admission to sanatoriums. The following table shows the age incidence of reported cases :—

Age.	Cases.		Total.
	M.	F.	
1– 4	...	...	...
5–14	...	1	1
15–24	5	9	14
25–34	6	5	11
35–44	9	3	12
45–54	13	4	17
55–64	2	...	2
65 and over	...	1	1
Age not stated	2	...	2
Total	37	23	60

DENGUE FEVER.

For the first time on record Newcastle suffered from an epidemic of dengue fever during 1926. The mosquito vector, *Aedes œgypti* (Stegomyia fasciata), had been known for some years past to occur here, and the possibility of an outbreak of the disease had been forecasted, but no previous cases had been recorded.

On 12th February, 1926, a medical practitioner at Stockton reported the presence of several cases of fever with an unusual rash. The possibility of its being some form of mild endemic typhus was excluded by the absence of the Weil-Felix reaction in the first few cases seen, and the provisional diagnosis of dengue fever was soon confirmed. Further investigation showed that similar cases had been occurring in a limited area for some weeks previously, and a few days later newspaper reports of the presence of the disease at Coraki and other places on the North Coast of New South Wales came to hand. A sharp increase in the number of cases in Stockton occurred towards the end of February and lasted until April, several hundred persons being affected within a small area, the exact number being uncertain owing to the fact that the disease is not notifiable in New South Wales. Sporadic outbreaks occurred in the suburbs on the south side of the harbour during the next six or seven weeks. In each case precautions were taken to fumigate the house, and to have all houses within a radius of about a hundred yards visited by the Health Inspector and the occupants advised to employ insecticide sprays, and screen tanks and attend to possible breeding-places of *Aedes œgypti.* Possibly on account of this, no further extensive outbreaks occurred in Newcastle. Outbreaks occurred in Singleton, Cessnock, Maitland, and other towns in the district either at this time or later in the year.

The origin of the Stockton outbreak could not be definitely settled, but inquiry showed that probably the first cases occurred as early as the end of November, 1925, in the vicinity of a shipbuilding yard, where several boats trading to the Northern rivers had been on the slip about this time. *Aedes œgypti* was plentiful in the vicinity and the outbreak probably originated from this focus. The first cases were variously diagnosed as measles, scarlet fever, influenza, and even typhoid fever.

The symptoms of the disease were fairly constant, onset with feelings of chilliness, occasionally definite rigor, often marked dizziness, headache (frontal or over vertex) pain in eyeballs, especially felt on moving the eyes, backache, felt most in the small of the back, occasionally vomiting or diarrhœa, tongue very thickly coated with white fur, anorexia, sharp rise of temperature to 101 deg. or higher. The rashes varied considerably in appearance and situation. In some cases carefully observed the rash was entirely absent. Joint swellings, quickly subsiding, were observed in a few cases.

The course of the disease was usually short and no deaths were reported. The debility and anorexia during convalescence, however, in many cases lasted for weeks.

Prevention.—With one exception, all the municipalities in Newcastle and suburbs had adopted Ordinance No. 41 under the Local Government Act, 1919, by the end of the year. This gives the council power to enforce the suppression of breeding of mosquitoes on householders' premises. A "Mosquito Week" was held in Newcastle and suburbs during the year, and by means of window-displays, posters, cinematograph films, and newspaper articles publicity was given to the eradication of *Aedes œgypti.*

PLAGUE.

The temporary employment of one rat-catcher by the Department was continued during the year. Trapping along wharves and in warehouses on the south side of the harbour was carried out, 1,872 rats being trapped by him.

The Newcastle City Council continues to pay a bonus of 6d. per rat brought to the depot in Parry-street, a sum of £17 5s., representing 690 rats, being paid during 1926. The majority of these, as well as of those trapped by the Health Department's rat-catcher, were examined for signs of plague, but no evidence of such infection was found.

The Railway Department and the Department of Navigation continue to lay poison baits on their premises; 9,650 baits were laid in this way by the Department of Navigation, of which 3,905 were taken.

Housing.

The housing shortage continued, but perhaps not so acutely as during the previous year, fewer cases of overcrowding being brought under notice. As in previous years, a number of inspections of houses were made by Inspector Godfrey and myself in areas where the councils do not employ certificated health inspectors. In most cases where houses were found to be below the requiried standard, it was found possible to effect the improvements necessary to render them habitable. In a few cases, where this was impossible, the houses were demolished by the owners after the application of a closing order by the council.

The system of a regular house-to-house inspection by the Council's inspectors, which is indicated by the provisions of Section 57 of the Public Health Act, 1902, requires more attention by local authorities. There appears to be a very considerable interval between inspections in some cases. Provision for an annual or biennial inspection could perhaps be made by regulation under the Amending Act of 1921. Conditions of overcrowding or verminous infestation would then be more quickly brought to notice than at present.

Infantile Mortality.

Births in the district during 1926 numbered 5,209, of which 1,097 were in private hospitals or similar institutions. The deaths of 324 children under one year of age were recorded, giving an infantile mortality rate of 62·2, compared with 57·7, the rate for this district in 1925, and 57·6 for the State of New South Wales (1926). The average rate for the previous five years in this district was 63·3.

Maternal Mortality.

The number of deaths from causes connected with childbirth in 1926 was 24, showing a death-rate in childbirth of 4·6 per thousand births, compared with 5·8 for 1925 and 5·2 for the whole State (1925); 16 of these deaths, or 66·6 per cent., occurred in institutions. The provision of skilled ante-natal care either at public hospitals or in connection with the Baby Health Centres and a campaign of publicity in connection with pre-natal work would appear to be advisable.

Private Hospitals.

Inspections of the 53 private hospitals in the district were made at intervals during the year. The total number of beds available at private hospitals in the district during 1926 was 307. During the year 9 licensees relinquished the license of their premises, and 15 new premises were licensed. The majority of these were for maternity cases only. Licensed private hospitals were satisfactorily conducted, and the keeping up-to-date of registers of patients showed improvement.

Milk Supply.

During the early part of the year a number of milk samples from dairymen, vendors, and wholesale distributors were taken for the purpose of bacterial examination. Between two and three hundred samples were examined. On the whole the milk was found to comply with the bacterial standards laid down by regulations under the Pure Food Act, though there were exceptions. Where a high count was found repeatedly in the case of a dairyman, an inspection of the dairy premises was made, and it was usually found that there was some obvious and preventible factor causing contamination. The most frequently found cause of a high bacteria count was dirty unwashed bails and milking sheds. When bails and sheds were properly washed down a reduction in the bacteria count followed. Another frequent cause was the storing of hay in the same shed where cows were being milked, or in a loft above the bails. Where such stores of hay were walled off from the milking shed a fall in the number of bacteria was found.

A third important factor was found to be the heat of the water used for cleansing milk cans and utensils. In cases where washing water had to be brought some distance from the kitchen to the dairy the water was far below boiling-point when used.

Milk from vendors' cans averaged a much higher count than from their supplying dairymen after even a short interval, probably owing to the extra handling and to lack of care of utensils. The mixed milk from wholesalers' vats, chilled on arrival at the premises, was in every case within the bacterial limits required by the Pure Food Regulations. The pasteurised milk (all treated by the "flash" method) showed a fairly low count, averaging under 50,000 organisms per cubic centimeter.

A comparison of bacteria counts in 27 samples with the reductase test as performed at the local butter factory showed a fairly close correspondence, with a few exceptions. It would appear that the reductase test, as carried out in this factory, is a fairly accurate method of classifying milk as reasonably clean or otherwise.

PURE FOOD ACT.

During the year 53 inspections of shops were made by Nurse Inspector McKay. Foodstuffs condemned totalled 20 cases sardines, 42 dozen red herrings, 22 tins salmon, 8 dozen tinned cheese.

Need for services of whole-time Food Inspector.—Short visits were made to the district by inspectors from the Pure Food Branch of Head Office staff. Owing to the small amount of pure-food work done by health inspectors of local councils, there is a very great need for a whole-time inspector under the Pure Food Act to be stationed in this district.

NOXIOUS TRADES ACT.

Owing to better means of transport being available this year, it was possible to make frequent inspections of all premises licensed for carrying on noxious trades. On the whole, the licensees were found to be conducting their trades satisfactorily. Necessary improvements were carried out in a few cases.

HOSPITAL ACCOMMODATION.

Convalescent Hospital.—The Convalescent Home at New Lambton, purchased by the Newcastle General Hospital authorities, was opened during the year. A large area of land was added to it, and it has become a very important addition to the General Hospital, in relieving congestion in the wards, the convalescent patients benefiting greatly by the change from the seaside to the hills and bushland.

Infectious Diseases Hospital.—Plant and estimates for the proposed infectious diseases hospital at Waratah were prepared by the Government Architect's branch during the year, but so far a commencement has not been made with the erection of buildings. It is regrettable that no provision has yet been made for emergency accommodation in the event of any unusually large epidemic.

Venereal Diseases Clinic.—Plans and estimates of the proposed clinic for the treatment of venereal diseases at the Newcastle Hospital have been drawn up, but still no adequate provision has been made for the treatment of these diseases at Newcastle. Negotiations were entered into between the Board of the Newcastle Hospital and the Federal and State Departments of Health, but have not so far resulted in any definite agreement as to the provision of funds for this urgently necessary work.

MISCELLANEOUS SERVICES.

During the year approximately 250 medical examinations were made comprising (*a*) all first-class pilots stationed at Newcastle, (*b*) candidates for employment in the public service, or public servants requiring medical examination on account of sickness or invalidity, (*c*) young persons without means seeking employment in factories for the first time, (*d*) applicants for admission to hospitals or asylums, (*e*) claimants for compensation under the Workers' Compensation Act.

Under instructions from Head Office, visits were made outside the district to Murwillumbah, Lismore, Casino, Tenterfield, *re* dengue fever outbreaks; to Vacy *re* infectious diseases; to Dungog and Fosterton *re* typhoid outbreak; to Stroud and Tea Gardens *re* proclamation of building areas; to Maclean and Grafton *re* private hospitals, &c.

Bacteriological Laboratory.—Examinations of specimens of sputum from the Newcastle Throat and Chest Dispensary and from medical practitioners in the district were made, and also of a limited number of throat swabs, but owing to the facilities afforded by the Newcastle Hospital laboratory it was found necessary to examine only a limited number of pathological specimens. The bacterial investigations of the Newcastle milk supply was continued during the early part of the year.

TABLE 4.—Births and Deaths—Each Municipality—City of Newcastle and adjacent Suburbs—1926.

Municipality.	Estimated Mean. Population.	Births.						Deaths.					Number who died in Public Institutions (included in foregoing).
		Total Births.			Illegitimate (included in foregoing).			M.	F.	Total.	Deaths under 1 year.		
		M.	F.	Total.	M.	F.	Total.				M.	F.	
Newcastle City	15,190	160	132	292	10	8	18	235	142	377	28	19	294
Adamstown	4,540	65	74	139	1	1	2	16	8	24	5	...	2
Carrington	3,120	36	38	74	...	3	3	8	13	21	4	5	......
Hamilton	17,400	187	207	394	7	4	11	54	52	106	14	7	7
Lambton	4,130	67	51	118	2	1	3	17	14	31	7	1	......
Lambton, New	5,080	66	71	137	2	1	3	15	18	33	2	4	1
Merewether	7,710	153	134	287	37	23	60	26	16	42	11	7	10
Stockton....................	5,380	61	62	123	1	2	3	17	58	75	4	2	48
Wallsend	7,130	97	64	161	2	3	5	74	55	129	16	6	80
Waratah	16,040	299	256	555	15	14	29	58	54	112	13	8	28
Wickham	13,130	151	145	296	6	7	13	35	30	65	11	7	......

HUNTER RIVER COMBINED SANITARY DISTRICT.

TABLE 5.—Districts comprised in Newcastle and Suburbs, together with six outside Municipalities, Greta, East and West Maitland, Morpeth, Raymond Terrace, Singleton; and five Shires, Bolwarra, Cessnock, Lake Macquarie, Port Stephens, and Tarro, enumerated below.

Births and Deaths, each Local Area—Hunter River Combined Districts, 1926.

Municipality or Shire.	Estimated Mean Population, 1926.	Births.						Deaths.			Deaths under 1 year.		Number who died in Public Institutions (included in foregoing).
		Total Births.			Illegitimate (included in foregoing).								
		M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	
Newcastle and Suburbs	98,850	1,342	1,234	2,576	83	67	150	555	460	1,015	115	66	470
Greta	1,500	16	17	33	1	...	1	3	9	12	...	...	......
Maitland, East	3,910	53	55	108	1	2	3	18	17	25	1	5	......
„ West	8,920	164	153	317	6	6	12	84	84	168	13	13	109
Morpeth	1,070	14	14	28	1	...	1	7	3	10	...	...	......
Raymond Terrace	830	33	18	51	2	...	2	4	1	5	1	...	......
Singleton	3,280	105	113	218	4	4	8	15	13	28	4	4	7
Bolwarra Shire	3,310	41	42	83	...	2	2	18	14	32	3	1	1
Cessnock	37,010	551	535	1,086	16	18	34	132	102	234	28	28	56
Lake Macquarie Shire	23,200	286	263	549	6	6	12	92	55	147	16	14	19
Port Stephens Shire	3,850	21	10	31	1	...	1	13	9	22	...	1	......
Tarro Shire	5,960	70	59	129	2	...	2	56	25	81	8	3	44
Total	191,780	2,696	2,513	5,209	123	105	228	997	792	1,789	189	135	706

Table 6.—Causes of Death of Children under 1 year—Hunter River Combined Sanitary District—1926.

Causes of Death.	NEWCASTLE AND SUBURBS.												REMAINDER OF COMBINED DISTRICT.											TOTAL DEATHS.
	Newcastle.	Adamstown.	Carrington.	Hamilton.	Lambton.	New Lambton.	Merewether.	Stockton.	Wallsend.	Waratah.	Wickham.	Total.	Greta.	Maitland, East.	Maitland, West.	Morpeth.	Raymond Terrace.	Singleton.	Bolwarra Shire.	Cessnock Shire.	Lake Macquarie Shire.	Port Stephens Shire.	Tarro Shire.	
Whooping cough	...	...	...	...	...	...	...	1	...	...	...	1	...	...	1	...	1	...	...	...	1	...	...	4
Diphtheria	1	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	2
Influenza	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Dysentery	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cerebro-spinal meningitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculosis—intestines, peritoneum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other General Diseases	2	...	1	1	...	...	...	...	1	...	...	5	...	...	...	...	...	...	...	3	...	...	...	8
Meningitis	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...	1	4
Convulsions	...	...	...	1	1	...	...	...	...	...	...	2	...	...	...	...	...	1	...	2	1	...	...	6
Bronchitis	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	3
Pneumonia	8	...	1	2	...	...	...	...	1	2	...	14	...	...	1	...	...	...	1	3	3	...	...	22
Diarrhœa and enteritis	17	...	...	1	1	1	3	...	6	3	5	37	...	3	16	...	...	2	...	12	5	...	3	78
Intestinal obstruction	1	...	...	...	...	...	...	...	2	...	...	3	...	...	...	...	...	...	...	...	...	...	1	4
Diseases of the Skin	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Congenital malformations	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Congenital debility	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......	...	...	...
Premature birth	9	3	2	10	4	4	5	3	4	10	8	62	...	...	3	...	...	2	1	19	8	1	3	99
Injury at birth	1	...	...	1	...	...	...	1	3	1	...	7	...	1	3	...	...	...	2	1	5	...	2	21
Other diseases peculiar to early infancy	5	1	3	3	2	1	9	1	3	4	4	36	...	1	...	...	...	3	...	11	3	...	1	55
Accident	1	...	...	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	1	...	...	3
All other causes	1	1	...	...	...	...	1	...	2	...	1	6	...	1	1	...	...	...	...	2	3	...	...	13
Total	47	5	9	21	8	6	18	6	22	21	18	181	...	6	26	...	1	8	4	56	30	1	11	324

No. 6.—Causes of Death—Hunter River Combined Districts—1926.

Causes of Death.	NEWCASTLE AND SUBURBS.												REMAINDER OF COMBINED DISTRICTS.											Deaths in Institutions (included in foregoing).	AGES.									Total Deaths.
	Newcastle.	Adamstown.	Carrington.	Hamilton.	Lambton.	Lambton, New.	Merewether.	Stockton.	Wallsend.	Waratah.	Wickham.	Total.	Greta.	Maitland, East.	Maitland, West.	Morpeth.	Raymond Terrace.	Singleton.	Bolwarra Shire.	Cessnock Shire.	Lake Macquarie Shire.	Port Stephens Shire.	Tarro Shire.		Under 1	1 - 4	5 - 13	14 - 19	20 - 29	30 - 39	40 - 49	50 - 64	65 and over.	
Typhoid Fever	3	...	...	...	...	...	...	...	4	...	...	7	...	...	...	...	...	...	...	1	...	...	1	8	...	...	...	4	5	...	...	...	...	9
Measles	3	...	...	...	...	...	...	...	2	...	...	5	...	...	...	1	...	1	...	2	1	...	...	7	1	6	3	...	...	...	...	...	...	10
Scarlet Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Whooping Cough	...	...	...	...	...	...	...	2	...	...	...	2	...	...	1	...	1	...	...	1	1	...	...	...	4	2	...	...	...	...	...	...	...	6
Diphtheria	9	...	...	...	...	...	...	...	...	1	...	10	...	...	1	...	...	...	...	1	...	...	3	14	2	9	2	...	1	...	1	...	...	15
Influenza (with Pneumonia)	1	...	...	2	...	...	...	...	1	1	...	5	...	...	1	...	...	...	...	1	...	...	...	4	1	...	...	1	1	...	1	2	1	7
Influenza (Other)	1	...	...	...	...	1	...	1	...	...	...	3	...	...	...	...	...	...	...	2	2	...	1	2	...	1	...	...	...	1	1	...	5	8
Dysentery	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	1
Erysipelas	3	...	1	...	...	...	...	...	...	...	...	4	...	...	1	...	...	...	...	...	...	...	1	4	3	1	...	...	...	...	...	1	1	6
Infantile Paralysis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lethargic Encephalitis	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
Cerebro-spinal Meningitis (Epidemic) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	1
Other Epidemic Diseases	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	2
Tuberculosis of Respiratory System ...	8	...	...	4	3	...	1	6	1	2	2	27	1	2	4	...	...	1	2	15	7	1	1	12	...	...	...	2	9	15	16	14	5	61
Tuberculosis-Meninges, etc....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	1	1	...	...	...	...	...	...	2
Other Tuberculous Diseases	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	1	...	...	1	...	...	...	1	...	1	1	...	...	3
Cancer	24	2	1	11	3	8	3	6	8	9	8	83	3	4	9	1	...	3	4	22	5	1	6	40	1	...	...	2	1	6	18	49	64	141
Diabetes	5	...	...	1	...	...	...	...	3	1	...	10	...	...	2	...	...	...	1	2	1	...	1	9	...	...	...	1	...	2	1	6	7	17
Other General Diseases	19	...	1	9	...	...	1	...	4	1	...	35	...	2	7	...	...	1	1	9	1	1	5	27	3	2	3	2	7	6	9	14	16	62
Meningitis	5	...	...	1	...	...	...	...	1	...	...	7	...	...	4	...	...	1	...	2	1	...	1	13	4	1	1	...	4	2	1	2	1	16
Cerebral Hæmorrhage	18	1	1	11	1	2	...	2	3	8	6	53	...	2	14	...	...	2	1	10	9	...	5	31	...	1	...	...	3	4	11	25	52	96
Convulsions of Infants	...	...	...	1	1	...	...	...	...	...	...	2	...	...	...	...	...	1	...	2	1	...	...	...	6	...	...	...	...	...	...	...	...	6
Other Nervous Diseases	14	1	...	1	2	5	...	9	4	6	3	45	...	1	5	...	1	...	1	2	3	1	3	29	4	3	3	4	2	7	7	9	23	62
Diseases of the Heart	42	7	3	14	7	5	10	18	14	27	8	155	4	8	24	4	2	1	8	35	28	5	5	88	2	...	4	6	4	12	18	72	161	279
Other Circulatory Diseases...	9	3	...	4	...	...	...	4	1	3	2	26	...	...	3	1	...	1	1	3	4	1	2	16	...	...	...	...	...	4	3	10	25	42
Bronchitis	5	...	4	2	...	1	1	...	1	...	3	17	...	...	2	...	...	...	...	4	2	...	1	6	3	1	...	...	...	1	1	2	18	26
Pneumonia	39	2	1	9	1	1	1	8	10	6	5	83	...	1	17	1	...	1	1	16	10	...	6	82	22	33	6	6	6	6	11	13	33	136
Other Respiratory Diseases...	6	...	...	2	...	...	1	...	2	2	2	15	...	...	2	...	...	...	...	2	4	1	...	8	...	3	1	...	...	1	2	7	10	24
Diseases of the Stomach	6	...	...	...	...	...	...	...	4	2	...	12	...	...	1	1	...	...	...	2	3	...	...	12	3	2	...	1	1	4	2	3	3	19
Diarrhœa and Enteritis	32	2	2	1	4	3	4	1	10	4	5	68	...	6	22	...	...	3	2	21	7	2	6	60	78	42	2	...	1	...	1	3	10	137
Appendicitis	5	...	...	...	...	...	...	...	...	...	...	5	...	...	4	...	...	...	...	1	1	...	1	11	...	...	4	2	1	1	1	2	1	12
Hernia, Intestinal Obstruction	6	...	...	...	...	...	...	...	2	...	...	8	1	...	1	...	...	...	...	...	...	1	2	10	4	1	...	...	...	2	...	1	5	13
Cirrhosis of the Liver	2	...	...	...	...	...	1	...	...	...	...	3	...	...	1	...	...	...	1	...	...	...	...	2	...	...	...	...	1	...	...	3	1	5
Peritonitis	...	...	...	1	...	...	1	...	2	...	...	4	...	...	4	...	...	...	...	...	...	...	...	6	1	...	3	1	1	1	...	...	1	8
Other Digestive Diseases	1	...	...	1	...	...	...	...	4	3	...	9	...	...	1	...	...	...	...	5	...	...	1	8	1	1	1	1	2	...	3	3	4	16
Bright's Disease (Acute and Chronic) ...	21	2	1	9	...	1	1	3	12	3	...	53	...	2	12	...	...	...	1	5	14	2	4	40	2	1	4	...	3	7	7	27	42	93
Other Genito-Urinary Diseases	7	...	...	...	...	...	...	...	5	2	...	14	...	...	1	...	...	1	...	1	1	...	1	16	...	...	...	...	2	4	3	5	5	19
Puerperal Septicæmia	4	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	2	1	1	...	...	4
Other Puerperal Diseases	9	...	...	3	1	...	1	...	1	2	1	18	...	...	1	...	...	...	...	...	...	...	1	12	...	...	...	4	6	8	2	...	...	20
Premature Birth	9	3	2	10	4	4	5	3	4	10	8	62	...	...	3	...	...	2	1	19	8	1	3	19	99	...	...	...	...	...	...	...	...	99
Other Developmental Diseases of Infants	6	1	3	4	2	2	9	2	6	5	4	44	...	2	3	...	...	3	2	13	8	...	3	20	76	2	...	...	...	...	...	...	...	78
Senility	3	...	1	2	1	...	...	5	8	7	5	32	1	2	6	...	1	2	2	5	8	2	7	11	...	...	...	...	...	...	...	1	67	68
Suicide	5	...	...	...	...	...	1	1	...	...	...	7	2	...	...	...	...	1	1	4	...	...	...	2	...	...	...	1	2	3	3	3	3	15
Accident	31	...	...	1	...	...	...	4	9	3	3	51	...	3	9	1	...	1	2	17	12	2	10	54	3	8	11	13	19	15	16	13	15	108
All Other Causes	14	...	...	2	...	...	1	...	3	3	...	23	...	...	2	...	...	1	...	5	4	1	...	16	1	1	4	2	1	7	7	6	7	36
Total	377	24	21	106	31	33	42	75	129	112	65	1015	12	35	168	10	5	28	32	234	147	22	81	706	324	122	54	55	85	123	143	297	586	1,789

3.—Broken Hill.

The position of Medical Officer of Health at Broken Hill has been vacant since 31st December, 1925.

Investigational visits in connection with general sanitation and maternal and infant welfare work were made by Dr. Morris and other officers of the department during 1926. Dr. Morris recommended :—

1. That a sanitary inspector of the Department should be sent to Broken Hill, where he should be stationed for several months, and that every effort to bring about an improvement in sanitation should be made by him, as far as possible in co-operation with the local authority, but, if necessary, independently of it.
2. That if such an inspector should be stationed at Broken Hill, special nurses should be detailed to assist him in combating gastro-intestinal infections during late summer and autumn.
3. That laboratory facilities under departmental control should be provided, and that investigations concerning gastro-intestinal infections should be carried out in addition to other work.
4. That a publicity and educational campaign should be instituted at the earliest possible moment.

Vital Statistics.—The Broken Hill Council has supplied the following figures for 1926 :

The death rate, birth rate and infantile mortality rate are given below with figures for 1925 opposite :—

	1926.	1925.		1926.	1925.
Deaths, males	193	167	Death rate per 1,000 of population ..	10·8	10·1
,, females	111	116			
Births, boys	377	367	Birth rate per 1,000 of population....	26·5	24·5
,, girls...	367	321			

Infantile Mortality Rate.—Deaths of infants under 1 year per 1,000 registered births :

1926.	1925.		1926.	1925.
55	48	giving a rate of—	73	69

Of the 55 deaths (under 1 year) in 1926, 6 died of pulmonary disease, 14 of intestinal diseases, and 20 were premature births. The other 15 died from various causes.

The death rates and infantile mortality rates for the years from 1918 to 1924 are given below :—

	1918.	1919.	1920.	1921.	1922.	1923.	1924.
Death rate	15·50	21·14	13·69	13·46	14·70	11·26	17·09
Infantile mortality rate ...	99·16	146·65	111·79	122·85	97·00	91·68	146·00

Notifiable Infectious Diseases.—The following notifications were received from Broken Hill during 1926 :—

Typhoid Fever.		Scarlet Fever.		Diphtheria.		Cerebro-spinal Fever.	
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
93	......	82	......	60	......	3	......

1926.

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Report upon the State Hospitals and Asylums under the Control of the Director-General of Public Health.

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SECTION III.

REPORT upon the State Hospitals under the Control of the Director-General of Public Health.

1.—THE COAST HOSPITAL, SYDNEY: REPORT FOR THE YEAR 1926.

The Medical Superintendent to The Director-General of Public Health.

Sir,

I have the honor to submit the following Report on the working of the Coast Hospital during the year 1926.

The Staff during the year has been as follows:—

Honorary Medical Staff.

Honorary Physicians.—Alfred Walter Campbell, M.B., M.S. (Edin.), M.D.; James McDonald Gill, M.D. (Lond.), L.R.C.P. (Lond.), M.R.C.S. (Eng.); Hazlett Hamilton Marshall, L.R.C.P.S. (Edin.), L.F.P.S. (Glas.), M.B., M.S. (Edin.); Alan Worsley Holmes àCourt, M.D. (Syd.), M.R.C.P. (Lond.), Medaille d'Epidemies.

Honorary Surgeons—Sir Charles Clubbe, L.R.C.P. (Lond.), M.R.C.S. (Eng.); George Henry Abbott, M.B., Ch.M. (Syd.); Sir Alexander MacCormick, M.B., M.S., M.D. (Edin.), M.H.F.R.C.S. (Eng.), H.F.R.C.S. (Edin); John Colvin Storey, M.B., Ch.M. (Syd.), F.R.C.S. (Eng.); Edward Thomas Thring, F.R.C.S. (Eng.), L.R.C.P. (Lond.); Harry Cecil Rutherford Darling, M.D. (Lond.), F.R.C.S. (Eng.); Earle Christian Grafton Page, M.B. (Syd.); Thomas Maynard Furber, M.B. (Syd.); James Harold Willmott Leadley, M.B., M.S. (Syd.).

Honorary Gynæcologists.—Joseph Foreman, L.S.A. (Lond.), L.M.R.C.P. (Edin.), M.R.C.S. (Eng.); Ralph Worrall, M.D., M.S. (Ire.).

Honorary Ophthalmic Surgeons.—Charles Gordon McLeod, M.B., M.S. (Edin.); Albert Tange Dunlop, M.B., M.S. (Syd.).

Honorary Ear, Nose, and Throat.—Herbert Huff Johnston, M.B. (Syd.).

Honorary Dermatologist.—Wahab McMurray , M.D., M.S. (Ire.).

Honorary Urogolist.—Robert Joseph Silverton,M.B., M.S. (Syd.).

Honorary Radiographer.—Malcolm Frizell, M.B. (Syd.).

Honorary Orthopædic Surgeon.—Edmund Bruce Mortimer Vance, M.B., M.S.

Resident Medical Staff.

Medical Superintendent.—Reginald Jeffery Millard, M.B., Ch.M. (Syd.), D.P.H. (Camb.), C.M.G., C.B.E.

Deputy Medical Superintendent.—Henri Victor David Baret, B.A., M.B.

Senior Assistant Medical Officers.—Robert Maxwell McMaster, M.B., M.S. (Syd.), D.S.O.; Angus Johnston Murray, M.B. Ch.M. (Syd.); Cecil Julian Manning Walters, M.B., Ch M. (Syd.).

Junior Medical Officers.—8.

Manager.—Mr. R. Goldrick.

Matron.—Miss C. M. Burne.

Sub-Matron—Miss C. M. Dickson— R.R.C.

Dispenser—Miss E M. Kirton.

Clerk and Storekeeper.—Mr. W. Dwyer.

Sisters—13.

Nurses—194.

Other Female Staff—53.

Attendants (Ward)—16.

Other Male Staff—50.

STATISTICS.

Detailed tables of statistics will be found in the Appendix, but I may summarise here the more important of these.

I.—The following table is a comparative general statement for 1926 and the previous year:—

	1925.	1926.
Remaining in Hospital on 31st December	579	657
Admitted during the year	8,458	10,175
Total cases under treatment during the year	8,935	10,754
Discharges, including deaths	8,356	10,097
Deaths	536	601
Death-rate per cent. of total discharges	6·41	5·9
Average daily number of occupied beds	578·06	668·09
Average stay of patients (in days)	23·61	23·74

For the year the number of admissions was 1,717 more than in 1925, and the average daily number of occupied beds was 668·9, as against 578·06 in 1925. The average stay of patients was 23·74 days.

II. *Infectious Diseases.*—The following table summarises the work of the year in regard to these, and affords a comparison with 1925. In this table the "cases" are cases treated until discharge or death, and the fatality is reckoned on the total cases treated. Cases remaining in hospital on 31st December, 1926, are not included in these figures for the year:—

	1925.			1926.		
	Cases.	Deaths.	Fatality.	Cases.	Deaths.	Fatality.
Typhoid Fever	53	4	7·5	34	4	11·7
Measles	256	11	4·2	705	35	4·9
Scarlet Fever	893	12	1·3	1,557	38	2·4
Whooping-cough	99	11	11·1	39	5	12·8
Diphtheria	828	3	·3	994	13	1·3
Influenza	100	...	...	254	5	1·9
Erysipelas	98	4	4·08	75	5	6·6
Other Epidemic Diseases	43	3	6·9	65	...	...

Typhoid Fever.—The number of cases under treatment was less than in 1925; the fatality was higher.

Scarlet Fever.—Was more prevalent than in 1925—3,424 cases being notified in the whole metropolitan area during 1926 as against 1,916 during 1925, and the cases treated at the Coast Hospital showed a corresponding increase. There were 38 deaths.

Diphtheria.—In the Metropolis the cases notified amounted to 2,048 in 1926 as against 1,626 in 1925; and the cases treated at the Coast Hospital were 1,018 as against 787 in 1925. The percentage of notified cases which came to this hospital for treatment was—in 1925, 48·4 per cent.; and in 1926, 49·2 per cent. Of the 13 fatal cases, 4 died within seven days of admission. Intubation was performed on 6 patients and tracheotomy on 5.

Anti-toxin was administered in the hospital to 1062 cases in the doses shown in the following table:—

Anti-toxin.	Cases.	Percentage of Total Cases.	Anti-toxin.	Cases.	Percentage of Total Cases.
2,000 units	26	2·4	36,000 units	7	0·6
4,000 "	93	8·7	38,000 "	...	...
6,000 "	86	8·09	40,000 "	12	1·1
8,000 "	175	16·47	42,000 "	1	0·09
10,000 "	212	19·96	44,000 "	1	0·09
12,000 "	67	6·3	46,000 "	1	0·09
14,000 "	14	1·3	48,000 "	...	...
16,000 "	172	16·19	50,000 "	1	0·09
18,000 "	8	0·7	52,000 "	...	...
20,000 "	94	8·8	60,000 "	3	0·28
22,000 "	6	0·5	70,000 "	1	0·09
24,000 "	19	1·78	74,000 "	...	...
26,000 "	27	2·5	80,000 "	1	0·09
28,000 "	3	0·28	90,000 "	...	...
30,000 "	21	1·97	100,000 "	1	0·09
32,000 "	8	0·7	120,000 "	1	0·09
34,000 "	1	0·09			

Altogether 3,591 cases of typhoid fever, measles, scarlet fever, diphtheria, influenza, meningitis, and whooping cough were treated. In the Appendix will be found some further details of these cases, viz.:—

Table III.—Age and sex distribution of cases discharged or died during the year.

Table IV.—Number of cases of diphtheria, scarlet fever, and typhoid notified within the Metropolis, and the percentage of these cases treated at the Coast Hospital in each of the years 1901–1926, inclusive.

Table V.—Duration of stay in hospital of cases of typhoid fever, measles, scarlet fever, whooping cough, and diphtheria.

Table VI.—Fortnightly admissions of all patients during 1926.

Table VII.—Classification of diseases treated during 1926.

Table VIII.—Operations performed during 1926.

Table XI.—Summary table showing the work of the Coast Hospital and its cost each year from 1884 to 1926.

Abortion.—During the year 620 patients were treated for abortion. The admissions for this condition have increased of late years at a startling rate, as indicated by the following figures, which show the ratio of abortion cases to all cases treated in successive years 1919–1926 inclusive :—

Year.	Total patients treated.	Abortions.	Percentage.	Year.	Total patients treated.	Abortions.	Percentage.
1919	5,941	54	0·91	1923	8,769	381	4.34
1920	6,313	193	3·06	1924	8,667	436	5.03
1921	6,952	237	3·41	1925	8,935	497	5.56
1922	7,339	354	4·82	1926	10,754	620	5·76

3. *Expenditure.*—Table IX gives a detailed statement of the working expenses for 1925 and 1926, from which it will be seen that the total expenditure increased from £82,932 10s. 1d. to £94,153 9s. 9d. in 1926, and the average cost per occupied bed decreased from £143 9s. 2d. to £140 18s. 7d.

4. *Nursing.*—On 26th May, 1926, Miss Watson resigned from the position of Matron after holding that responsible office for twenty-one years, during which the Nursing Staff and the hospital in general profited inestimably from her unfailing devotion to duty and from the skill, tact, and sympathy with which she performed her important duties. Miss Burne (Sub-Matron) has been promoted to be Matron, and Miss C. M. Dickson, R.R.C., to be Sub-Matron.

Instruction by lectures and demonstrations was, as usual, given to the Nurses by the Medical Staff and Matron; and in invalid cookery by a specially engaged teacher (Miss Shepherd), as in former years. Examinations were held in accordance with regulations, and nurses passed as follows :—

First-year examination	47
Second-year ,, ...	40
Third-year ,, ...	38
Fourth-year ,, ...	59

During the year 20 certificated nurses left the hospital to take up private nursing, and to take positions in other hospitals. In addition to these, 8 Coast Hospital nurses passed the A.T.N.A. Obstetric Examination, after having the necessary training at Montrose Hospital, whilst 33 nurses passed the Nurses Registration Board Examination.

Sick leave was granted to 103 nurses, amounting in the aggregate to 2,967 days. Of these nurses, some were ill on more than one occasion, there being 162 cases of illness altogether. Of the sick nurses 10 had diphtheria, 325 days; 26 had scarlet fever, 545 days. All the nurses recovered satisfactorily.

5. *Laboratory.*—The following Table summarises the work done in the hospital laboratory month by month. In all, 14,123 cultures were examined for diphtheria. The practice was continued of accepting no diphtheria culture as negative unless found so after forty-eight hours' incubation.

1926.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Cultures examined for diphtheria—													
1. After 12–24 hours' incubation	967	873	1,118	1,284	1,505	1,240	1,173	1,182	1,272	1,262	1,097	1,150	14,123
2. Negative after 12–24 hours' incubation, and reexamined after 48 hours ...	744	676	849	937	1,170	938	926	1,091	1,083	965	939	902	11,220
3. Positive for diphtheria at second examination	71	57	70	69	76	64	56	40	35	38	31	31	638
4. Percentage of positives in second examination	9·6	8·4	8·2	7·4	6·5	6·8	6	3·7	3·3	3·9	3·4	3·4	5·7
Blood—Full counts	19	21	21	20	17	9	17	10	24	17	18	16	209
Leucocyte counts ...	17	36	40	44	30	18	23	35	22	27	23	67	382
Parasites, &c.	2	4	3	2	7	1	1	...	1	3	3	1	28
Cultures	6	5	1	1	4	1	6	3	4	3	8	4	46
Widals	17	22	23	29	14	8	13	19	16	13	16	62	252
Fluids—Cerebro-spinal	9	4	7	7	...	3	5	3	5	8	6	7	64
Body fluids	6	6	7	...	5	12	4	4	5	3	5	4	61
Fæces	1	...	...	1	...	...	...	2	2	1	2	9	18
Pus—For organisms, &c. ...	12	4	16	8	21	14	19	9	6	17	13	11	150
Smears—Gonococci	71	57	85	60	37	54	46	58	77	56	65	65	731
Leprosy	...	...	...	...	3	2	...	1	...	...	...	...	6
Diphtheria and Vincent's Angina ...	6	3	11	6	9	9	12	13	12	6	8	6	101
Sp. pallidum	6	12	11	4	6	2	5	1	4	...	6	5	62
Hairs and Scales for fungi ...	...	1	...	1	...	...	...	1	1	3	2	1	10
Sputum for T.B.	50	84	71	78	75	158	110	143	126	106	103	56	1,160
Urines—Bacteriological	1	3	2	1	...	3	...	2	...	1	...	9	22
Bacteriological and pus, &c.	57	30	55	50	46	47	68	68	47	66	64	39	637
Deposits only	4	17	10	8	8	13	11	9	9	8	7	4	108
Chemical	11	11	22	17	16	13	15	28	18	24	16	6	197
Vaccines prepared	2	3	3	3	1	8	8	7	9	1	10	4	59
Blood—Sugar	8	45	27	...	19	24	12	35	10	11	40	...	231
Typing for transfusion	2	21	6	16	11	...	7	13	21	48	3	8	156
Totals	2,018	1,938	2,388	2,577	3,004	2,577	2,481	2,737	2,774	2,649	2,454	2,436	30,033

The principal works carried out during 1926 by the hospital staff were the following:—

1. *Additions.*—Laundry water supply service, construction of dam, erection of pumping plant, and laying water-main from dam to laundry.
2. *Improvements, &c.*—Ward XIV hot water service and sterilizing rooms. Wards XVIII, XIX, and XXI, installing new electric light fittings. Nurses' Dining Hall, re-arrangement of accommodaton, hot water service, scullery, &c. Cottages 8 and 9, hot water service installed. Nurses' Sick Room, glazing verandah. Renovation of Operating Theatre, No. 4 Cottage, Laundry Block. Roof of Cottages 1 and 2, and furniture throughout the hospital. Repair and renovation of vehicles, and erection of retaining wall and sheds at poultry yards.
3. *General improvements* of flower gardens, lawns, and vegetable garden.

I have, &c.,

R. Goldrick, Manager. R. J. MILLARD, Medical Superintendent.

TABLE I.—General Statement of the working of the Hospital from 1st January to 31st December, 1926.

	Males.	Females.	Total.
Number of beds available in the General Division on 31st December, 1926	202	200	402
„ „ Infectious Division	......	......	311
„ „ Nurses' Sick Room	......	4	4
Total accommodation	......	......	717
Number of inmates remaining in hospital on 31st December, 1925	302	277	579
„ admitted during the year 1926	4,625	5,550	10,175
Total treated	4,927	5,827	10,754
Discharged—Cured	2,797	4,267	7,064
„ Relieved	1,251	884	2,135
„ Unrelieved	137	120	257
„ No Disease	14	26	40
Died	312	289	601
Total number discharged, or who died	4,511	5,586	10,097
Remaining in hospital on 31st December, 1926	293	364	657

Average daily number resident	668·09
Average residence of discharged patients in days	23·74
Rate of mortality on total number who were discharged or who died	5·9
Total cost of maintenance and treatment of indoor patients	£91,453 9s. 9d.
Average cost of patients per annum	£140 18s. 7d.

Out-patients—	Males.	Females.	Total.	Total Visits.
Total number of individuals who received treatment	1,739	2,793	4,532	9,063
Total cost of Out-patient treatment	....	....	£1,023	....

Hospital Staff on 31st December, 1926.

Medical and Administrative.	Number.	Nursing.	Number.	General.	Number.
Medical Superintendent	1	Sub-Matron	1	Foreman	1
Deputy Medical Superintendent	1	Asst. Sub-Matron	1	Artisans	8
Assistant Medical Officers	11	Sisters—		Attendants, Outdoor	9
Manager	1	Senior	7	,,	16
Matron	1	Junior	6	Telephone	
Dispensers	3	Nurses—		Attendants	4
Clerks	7	Staff	16	Male Cooks	4
Laboratory Assistants	2	Pupil	178	Female Cooks	6
X-Ray Assistant	1	Ward		,, Servants	28
		Attendants	16	Laundresses	12
Total	28	Housekeeper	1	Needlewomen	2
			226		90
				Total Staff	344

TABLE II.—Return showing the number of Wards, together with the cubic space and number of beds in each Ward, in the General and Infectious Divisions of the Coast Hospital for the year 1926.

Ward.	Cubic Space.	No. of Beds.	Cubic space per Bed in Ward.	Ward.	Cubic Space.	No. of Beds.	Cubic space per Bed in Ward.
1	32,100	48	668	16	11,520	13	886
3	12,000	10	1,200	17	16,915	30	564
4	12,900	11	1,173	18 and verandah	53,062	50	1,263
5 and gallery	31,368	25	1,254	19 and verandah	53,062	50	1,263
6	10,800	8	1,350	20 and verandah	53,062	50	1,263
7	10,800	8	1,350	21 and verandah	53,062	50	1,263
8 and gallery	32,268	24	1,344	23 and verandah	53,062	50	1,263
9	12,000	8	1,500	24	19,023	25	761
10 and N. Sick Room	16,356	14	1,168	25	19,023	25	761
11	22,320	26	858	26	19,023	25	761
12	23,880	28	853	27	19,023	25	761
13	28,236	41	688				
14	43,520	43	1,012	Total	686,681	717	
15	28,296	30	943				

TABLE III.—Discharges and Deaths during 1926, distributed under sex and age.

Age.	0–5		6–10		11–15		16–20		21–30		31–40		41–50		51–60		61–70		71–80		81–90		Total sexes.		Total cases treated	Total deaths.	Mortality per cent.
Sex.	M	F.	M	F.	M.	F.	M	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Male.	Female.			
1. *Infectious Diseases*—																											
Typhoid Fever—																											
Discharges	...	...	...	4	2	2	1	2	5	7	2	3	1	1	...	...	...	...	...	...	...	...	11	19	34	4	11·8
Deaths	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	1	...	...	...	...	...	1	3			
Measles—																											
Discharges	215	196	58	41	9	15	20	28	29	41	2	8	1	6	1	...	...	...	...	...	...	...	335	335	705	35	4·9
Deaths	19	7	3	3	...	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	22	13			
Scarlet Fever—																											
Discharges	167	202	143	332	69	185	35	84	39	161	22	57	2	16	1	2	...	2	...	...	...	...	478	1,041	1,557	38	2·4
Deaths	9	11	3	4	1	1	...	1	...	4	1	1	2	...	...	...	...	...	...	...	...	...	16	22			
Whooping Cough—																											
Discharges	18	10	3	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	21	13	39	5	12·8
Deaths	3	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1			
Diphtheria—																											
Discharges	298	270	115	118	23	33	11	16	12	46	3	23	4	1	2	4	1	1	...	...	...	...	469	512	994	13	1·3
Deaths	7	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	6			
Influenza—																											
Discharges	3	4	5	2	8	5	18	8	23	47	26	31	14	18	12	6	8	4	5	1	...	1	122	127	254	5	2·0
Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	1	...	...	...	...	...	4	1			
Plague—																											
Discharges	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Cerebro-spinal Meningitis—																											
Discharges	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
2. *Other Diseases*—																											
Discharges	163	125	74	71	132	132	275	308	681	1,058	493	703	391	439	290	260	195	132	55	35	1	...	2,750	3,263	6,514	501	7·7
Deaths	6	13	2	3	5	1	6	16	16	33	41	45	49	53	50	35	59	34	22	8	2	2	258	243			
Totals	908	845	406	580	250	375	366	463	805	1,400	590	872	464	536	359	308	265	173	82	44	3	3	4,498	5,599	10,097	601	...

Table IV.—Showing Number of Cases of Diphtheria, Scarlet Fever, and Typhoid Fever notified within the Metropolis, and the percentage of these cases treated at the Coast Hospital, in each of the years 1900–1926 inclusive.

	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.
Diphtheria.													
Cases notified in Metropolis...	278	439	393	690	738	695	659	659	880	1,144	2,109	1,834	2,632
Cases treated at Coast Hospital....	7	65	64	92	301	313	267	389	360	500	909	974	1,284
Percentage	2·51	14·8	16·3	13·33	40·8	45·03	40·51	59·03	40·91	43·7	43·10	53·10	48·7
Scarlet Fever.													
Cases notified in Metropolis...	464	884	1,253	2,910	1,361	1,136	1,869	976	1,153	836	394	369	304
Cases treated at Coast Hospital....	116	150	313	585	371	284	593	336	420	339	150	134	108
Percentage	25·00	16·96	24·98	20·10	27·26	25·00	27·45	34·43	36·43	40·55	38·07	36·31	35·5
Typhoid Fever.													
Cases notified in Metropolis...	983	829	610	833	665	561	485	505	678	700	812	488	535
Cases treated at Coast Hospital....	247	214	144	166	178	139	84	101	118	96	85	66	67
Percentage	25·12	25·81	23·6	19·93	26·77	24·77	17·32	20	17·4	13·71	10·46	13·52	12·5

	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.
Diphtheria.														
Cases notified in Metropolis...	2,045	2,244	2,551	2,829	2,576	2,399	988	1,825	2,916	1,807	1,722	2,115	1,626	2,048
Cases treated at Coast Hospital.	994	1,057	940	1,149	1,259	1,241	501	834	1,360	905	854	1,115	787	1,018
Percentage....	48·6	47·10	36·85	40·6	48·8	51·7	50·72	45·6	46·6	50·00	49·5	52·7	48·4	49·7
Scarlet Fever.														
Cases notified in Metropolis...	555	1,801	4,726	2,715	1,217	765	424	468	511	653	1,541	2,241	1,916	3,424
Cases treated at Coast Hospital.	287	715	1,224	968	564	333	174	167	174	229	622	1,045	842	1,668
Percentage....	51·71	39·7	25·9	35·7	46·3	43·5	41·04	35·6	34	35·0	40·4	46·6	43·9	48·7
Typhoid Fever.														
Cases notified in Metropolis	566	644	821	654	403	327	335	366	342	246	265	242	230	245
Cases treated at Coast Hospital.	77	81	104	79	21	41	20	56	49	33	51	58	50	60
Percentage....	13·78	12·58	12·67	12·0	5·2	12·5	5·97	15·3	14·3	13·4	19·2	23·9	21·7	24·4

Table V.—Duration of Stay in Hospital of cases of Typhoid Fever, Measles, Scarlet Fever, Whooping Cough, and Diphtheria.

Duration of Stay.	Typhoid Fever.			Measles.			Scarlet Fever.			Whooping Cough.			Diphtheria.		
	Cured.	Died.	Total.	Cured.	Died.	Total.	Cured.	Died.	Total.	Cured.	Died.	Total.	Cured.	Died.	Total.
1 week or less	...	2	2	195	23	218	11	15	26	6	2	8	26	4	30
1— 2 weeks..	...	2	2	330	6	336	17	9	26	5	2	7	134	1	135
2— 3 „ ...	...	...	...	79	4	83	16	6	22	9	1	10	351	1	352
3— 4 „ ...	2	...	2	28	1	29	154	2	156	3	...	3	204	3	207
4— 5 „ ...	3	...	3	12	...	12	729	2	731	2	...	2	95	1	96
5— 6 „ ...	5	...	5	7	...	7	391	1	392	2	...	2	75	1	76
6— 7 „ ...	6	...	6	7	1	8	63	2	65	4	...	4	36	...	36
7— 8 „ ...	5	...	5	2	...	2	40	1	41	1	...	1	21	1	22
8— 9 „ ...	2	...	2	3	...	3	33	...	33	1	...	1	16	...	16
9—10 „ ...	...	...	...	2	...	2	18	...	18	...	...	...	10	1	11
10—11 „ ...	1	...	1	1	...	1	15	...	15	1	...	1	3	...	3
11—12 „ ...	1	...	1	1	...	1	7	...	7	...	...	...	3	...	3
12—13 „ ...	2	...	2	2	...	2	6	...	6	...	...	...	2	...	2
13—14 „ ...	1	...	1	...	...	...	5	...	5	...	...	...	2	...	2
14—15 „ ...	1	...	1	...	...	...	3	...	3	...	...	...	1	...	1
15—16 „ ...	...	...	...	...	...	...	4	...	4	...	...	...	...	...	...
16—17 „ ...	...	...	...	1	...	1	2	...	2	...	...	...	1	...	1
17—18 „ ...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...
18—19 „ ...	...	...	...	...	...	...	2	...	2	...	...	...	1	...	1
19—20 „ ...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...
20—21 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21—22 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22—23 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23—24 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24—25 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25—26 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26—27 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27—28 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28—29 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29—30 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30—31 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31—32 „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32—33 „ ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Over 33 „ ...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...
Total ...	30	4	34	670	35	705	1,519	38	1,557	34	5	39	981	13	994

Table VI.—Fortnightly Admission of cases during 1926.

	Fortnight ending—																										Total.
	Jan.		Feb.		March.		April.		May.		June		July.			Aug.		Sept.		Oct.		Nov.		Dec.			
	14	28	11	25	11	25	8	22	6	20	3	17	1	15	29	12	26	9	23	7	21	4	18	2	16	31	
Typhoid Fever	2	1	2	3	1	2	3	2	3	1	1	1	1	1	2	1	2	1	1	1	1	1	3	5	12	13	67
Measles	38	21	11	9	12	29	11	16	14	19	13	10	8	14	29	48	64	87	46	40	43	29	25	31	21	12	700
Scarlet Fever	40	45	62	37	54	47	50	59	93	54	83	52	52	55	54	52	57	62	56	65	102	85	78	56	132	98	1,671
Whooping Cough	3	2	...	...	...	2	...	2	...	...	...	...	3	2	...	...	3	3	...	...	2	3	2	2	6	5	40
Diphtheria	28	35	19	47	48	42	69	62	50	57	69	45	47	26	45	28	28	47	30	25	32	20	33	20	35	30	1,017
Influenza	5	3	8	8	4	5	6	5	13	14	45	34	21	8	7	4	...	8	7	8	2	2	3	7	6	2	235
Other Diseases	244	238	268	280	269	256	238	243	284	235	226	214	234	226	234	238	249	254	254	239	238	279	268	248	246	193	6,445
Total....	360	395	370	384	388	383	377	390	457	380	437	356	366	332	371	371	403	462	394	378	420	419	412	369	458	353	10,175

TABLE VII.—Return of the Number of Persons under Treatment, the Order of Disease for which they were treated, and the Number of Deaths in each Order during the year 1926. (Includes cases remaining in Hospital on 31st December, 1926.)

	Discharged during the year.				Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital.
	Cured.	Relieved.	Un-relieved.	Died.			
CLASS 1.—GENERAL DISEASES.							
Typhoid Fever	30	...	...	4	33	34	52·8
Malaria	...	8	...	...	...	8	9
Measles	660	6	4	35	19	705	12·1
Scarlet Fever	1,515	4	...	38	224	1,557	36·4
Whooping-cough	30	4	...	5	9	39	22·4
Diphtheria	977	4	...	13	60	994	25·2
Influenza	243	6	...	5	2	254	10·9
Mumps	7	...	...	...	...	7	18
Dysentery	...	...	...	...	...	...	...
Erysipelas	66	4	...	5	2	75	10·8
Other Epidemic Diseases	63	2	...	...	1	65	11·8
Purulent Infection and Septicæmia	2	...	...	4	...	6	15
Anthrax	1	...	...	...	...	1	16
Tetanus	...	...	...	3	...	3	2·6
Rickets	...	...	...	...	...	...	...
Lethargica	1	...	...	2	...	3	10
Tuberculosis of the Lungs	2	48	3	20	4	73	31
,, Acute Miliary	...	...	...	...	...	...	...
,, Meningitis	...	...	...	3	1	3	6·3
,, Pott's Disease	...	11	...	...	...	11	113·5
,, Hips	2	10	1	...	5	13	141·6
,, Other	4	8	...	1	6	13	31
Poliomyelitis	...	9	...	...	2	9	74·5
Syphilis—Primary	...	57	1	1	6	59	33·3
,, Secondary	...	25	...	...	1	25	24·4
,, Tertiary	...	32	3	2	3	37	33·3
,, Cerebral and other Diseases	...	2	1	...	...	3	7
,, II 2, III 9	...	...	...	...	...	...	...
Soft Chancre	4	14	...	...	1	18	21·8
Gonorrhœal Disease	...	482	5	1	31	488	27·6
Cancer, &c., of the Mouth	17	8	9	4	1	38	32·2
,, of the Stomach and Liver	2	4	18	14	3	38	28·6
,, of the Peritonæum, Intestines, and Rectum	4	12	4	12	2	32	45·5
,, of the Female Genital Organs	...	20	6	9	1	35	31·9
,, of the Breast	14	1	3	2	...	20	27·3
,, of the Skin	9	4	5	1	1	19	26·6
,, of other Organs	8	12	14	9	5	43	34·6
Tumours	10	...	1	...	...	11	13·3
Acute Rheumatism	57	23	2	1	5	83	30·8
Chronic Rheumatism and Gout	5	39	8	...	2	52	32·4
Diabetes	...	83	...	15	5	98	44·6
Exophthalmic Goitre	4	6	...	...	2	10	58·1
Hodgkin's Disease	1	2	...	...	...	3	9
Anæmia, Chlorosis	4	20	3	5	2	32	47·9
Leprosy	...	...	...	...	...	...	...
Alcoholism, Acute and Chronic	7	12	1	1	1	21	13
Other Chronic Poisoning and Lead	1	2	...	...	...	3	13·3
Other General Diseases	1	...	...	...	...	1	4
Diseases of Spleen	...	...	...	...	1	...	...
Addison's Disease	...	...	...	...	...	...	...
Diseases of Pituitary Glands	3	4	1	1	...	9	19·8
Total, Class 1	3,754	988	93	216	441	5,051	...
CLASS 2.—DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE.							
Meningitis	2	...	...	6	1	8	14·5
Cerebro-spinal Meningitis	...	...	...	...	...	...	...
Other Diseases of the Spinal Cord	...	2	2	1	2	5	40·6
Cerebral Hæmorrhage	...	19	4	17	...	40	22·1
Paralysis without indicated cause	2	5	2	...	...	9	20
Other forms of Mental Alienation	...	...	5	...	...	5	6·2
Epilepsy	...	8	3	...	...	11	20·3
Chorea	11	6	1	...	1	18	51
Locomotor Ataxia	...	8	2	...	1	10	29·6
Neuralgia and Neuritis	16	35	8	1	2	60	26·9
Other Diseases of the Nervous System	16	36	8	3	3	63	13·6
Diseases of the Eye and Adnexa	5	1	...	...	...	6	5·8
Diseases of the Ear	25	11	...	...	2	36	21·4
Encephalitis	1	...	...	6	...	7	8·6
Cerebral Embolism and Thrombosis	1	6	1	...	1	8	33·7
Infantile Convulsions under 5	2	1	...	...	...	3	12·1
Total, Class 2	81	138	36	34	13	289	...
CLASS 3.—DISEASES OF THE CIRCULATORY SYSTEM.							
Angina Pectoris	...	2	...	1	...	3	26·6
Acute Endocarditis	...	1	...	7	1	8	46·7
Organic Diseases of the Heart	12	110	3	43	20	168	34·9
Diseases of the Arteries, Atheroma, &c.	...	...	...	...	...	...	...
Embolism and Thrombosis	...	...	1	1	...	2	8·5
Diseases of the Veins (Varices, Ulcer, and Hæmorrhoids)	73	19	4	...	...	96	25·7
Diseases of the Lymphatic System	7	2	...	...	...	9	11·6
Hæmorrhage	...	1	...	...	...	1	5
Pericarditis	1	...	...	...	1	1	26
Aneurism	...	...	...	...	...	...	...
Arteriosclerosis	12	...	...	7	...	19	30·1
Other Diseases—Circulatory System	1	2	...	...	...	3	7
Total Class 3	106	137	8	59	22	310	...

TABLE VII.—Return of the Number of Persons under Treatment, &c.—*continued.*

	Discharged during the year.				Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital
	Cured.	Relieved.	Un-relieved.	Died.			
CLASS 4.—DISEASES OF THE RESPIRATORY SYSTEM.							
Diseases of the Nasal Fossæ	32	4	2	...	1	38	5·6
Diseases of the Larynx	31	1	1	...	...	33	10·7
Capillary Bronchitis	...	...	...	...	...	...	...
Acute Bronchitis	57	7	...	1	...	65	15·9
Chronic Bronchitis	7	18	...	8	...	33	29
Broncho-Pneumonia	20	1	...	19	1	40	15·5
Pneumonia	234	6	...	57	9	297	21·1
Pleurisy	63	21	1	3	8	91	20·4
Asthma	4	17	2	1	4	24	16·4
Other Diseases of the Respiratory System	3	6	...	2	1	11	26
Congestion and Gangrene of Lung	...	...	...	...	...	...	...
Bronchitis, Unspecified	...	...	...	...	...	...	...
Total, Class 4	454	81	6	91	24	632	...
CLASS 5.—DISEASES OF THE DIGESTIVE SYSTEM.							
Gastritis	29	8	...	...	1	37	11
Diseases of the Teeth and Gums	...	...	...	...	...	...	...
Diseases of the Mouth and its Associated Organs	26	12	2	...	...	40	12·7
Diseases of the Pharynx	453	11	5	3	4	472	8·6
Ulcer of the Stomach	22	24	2	5	8	53	26·8
Other Diseases of the Stomach (Cancer excluded)	9	15	1	1	...	26	15·7
Diarrhœa and Enteritis (children under two years only)	9	...	...	6	1	15	17·1
Diarrhœa and Enteritis (children over two years and adults)	46	4	...	5	3	55	8·5
Appendicitis	304	41	2	6	16	353	10·8
Hernia, Intestinal Obstruction	87	10	18	14	2	129	21·8
Other Diseases of the Intestines	71	34	5	3	4	113	17·3
Diseases of the Anus and Fæcal Fistulæ	...	...	...	...	...	...	...
Cirrhosis of the Liver	...	9	1	6	1	16	22·5
Biliary Calculi	47	19	2	4	8	72	26·9
Other Diseases of the Liver	24	15	1	5	4	45	19·2
Simple Peritonitis (non-puerperal)	4	10	2	1	...	17	26·7
Hydatid undefined	3	1	...	...	1	4	29·5
Other Diseases of Digestive System	...	1	...	3	...	4	2·8
Oesophagus, Stricture of	2	...	...	...	...	2	17
Ulcer of Duodenum	17	21	2	2	...	42	26
Total, Class 5	1,153	235	43	64	53	1,495	...
CLASS 6.—DISEASES OF THE GENITO-URINARY SYSTEM AND ADNEXA (NON-VENEREAL).							
Acute Nephritis	7	5	...	2	1	14	35·1
Uterine Tumours	24	5	2	1	...	32	33·5
Other Diseases of the Kidneys and their Adnexa	68	62	8	7	5	145	19·5
Calculi of the Urinary Passages	19	18	4	2	3	43	16
Diseases of the Bladder	24	22	2	1	1	49	20·6
Other Diseases of the Urethra, Urinary Abscess, &c.	14	31	1	4	...	50	16·2
Diseases of the Prostate	11	19	4	10	1	44	28
Non-venereal Diseases of the Male Genital Organs	21	11	4	...	2	38	13·5
Salpingitis and Pelvic Abscess	83	84	4	4	6	180	28·4
Uterine Hæmorrhage	...	1	...	...	1	1	6
Other Diseases of the Uterus	...	...	...	...	...	...	...
Cysts and other Ovarian Tumours	17	...	1	1	1	19	39·7
Other Diseases of the Female Genital Organs	47	31	6	1	...	85	17·3
Non-puerperal Diseases of the Breast (cancer excepted)	7	1	1	...	...	9	18·2
Chronic Nephritis	3	30	1	47	4	81	29·7
Total, Class 6	350	320	38	80	25	783	...
CLASS 7.—PUERPERAL CONDITIONS.							
Abortion	590	24	2	4	10	620	10·6
Ectopic Gestation	21	...	...	...	1	21	29·6
Hyperemesis	5	1	...	...	...	6	15
Pyelites	1	...	...	...	...	1	11
Hæmorrhage	...	1	...	...	...	1	6
Retroversion	14	19	6	1	...	40	17
Albuminuria	1	...	1	...	...	2	28
Pregnancy	...	1	...	...	...	1	5
Other Accidents of Labour	15	5	...	2	1	22	46·5
Puerperal Diseases of the Breast	14	...	...	...	1	14	20·5
Puerperal Septicæmia	16	3	...	23	4	42	21·6
Total, Class 7	677	54	9	30	17	770	...
CLASS 8.—DISEASES OF THE SKIN AND OF THE CELLULAR TISSUE.							
Gangrene	1	...	...	...	...	1	32
Phlegmon, Acute Abscess	143	23	...	4	8	175	11·5
Other Diseases of the Skin and Adnexa	65	33	1	2	4	104	16·6
Scabies	...	...	...	...	...	...	...
Furuncle	17	1	...	...	...	18	10·4
Elephantiasis	...	...	...	...	...	...	...
Total, Class 8	231	60	1	6	12	298	...

TABLE VII.—Return of the Number of Persons under Treatment, &c.—*continued.*

CLASS 9.—DISEASES OF THE ORGANS OF LOCOMOTION.

	Discharged during the year. Cured.	Relieved.	Un-relieved.	Died	Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital.
Non-tuberculous Disease of the Bones	22	40	6	5	20	73	81·8
Arthritis and other Diseases of the Joints (Tuberculosis and Rheumatism excepted)	17	13	1	...	7	31	23·1
Other Diseases of the Organs of Locomotion	18	8	1	1	...	28	15·8
Total, Class 9	57	61	8	6	27	132	...

CLASS 10.—MALFORMATIONS.

	Cured.	Relieved.	Un-relieved.	Died	Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital.
Congenital Malformations	9	9	5	5	1	28	11·5
Total, Class 10	9	9	5	5	1	28	11·5

CLASS 11.—DISEASES OF EARLY INFANCY.

Nil.

CLASS 12—OLD AGE.

	Cured.	Relieved.	Un-relieved.	Died	Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital.
Senility	...	...	...	...	...	...	...
Total, Class 12	...	...	...	...	...	...	...

CLASS 13.—VIOLENCE.

	Cured.	Relieved.	Un-relieved.	Died	Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital.
Lysol Poisoning	...	...	...	...	...	...	...
Scalds and Burns (other than fire)	19	9	...	1	2	29	35
Poisoning by Food (not ptomaine)	4	...	...	...	...	4	5·7
Bite of Snake or Insect	3	...	...	...	...	3	1·3
Firearms Accidents	...	1	...	...	...	1	7
Cutting Instruments	7	...	...	...	2	7	14·9
Burning by Fire	...	...	...	...	1	...	...
Falls	62	11	3	3	3	79	31·2
Crushings	...	1	...	...	...	1	2
Railways and Tramways	5	3	1	...	2	9	26·7
Injuries by Vehicles and Horses	1	1	...	...	4	2	24·5
Shock	1	...	...	...	...	1	18
Other Injuries	15	1	1	...	3	17	17
Assault	...	...	...	...	...	...	...
Fractures (not obtainable)	58	20	3	5	2	86	21·5
Other Acute Poisonings (except gas)	6	...	...	1	...	7	4
Total, Class 13	181	47	8	10	19	246	...

CLASS 14.—ILL-DEFINED DISEASES.

	Cured.	Relieved.	Un-relieved.	Died	Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital.
Malnutrition	1	...	...	...	...	1	35
Debility	10	5	2	...	...	17	8
Marasmus	...	...	...	...	...	...	...
Observation	7	...	...	...	1	7	5·5
No disease	6	...	...	...	...	6	8
Nurslings with mothers, no disease	13	...	...	...	2	13	18
Mothers with nurslings, no disease	14	...	...	...	1	14	9
Total, Class 14	51	5	2	...	4	58	...

SUMMARY.

	Cured.	Relieved.	Un-relieved.	Died	Remaining in on 31st December, 1926.	Total.	Average number of days in Hospital.
Total, Class 1.—General Diseases	3,754	988	93	216	441	5,051	...
,, 2.—Diseases of the Nervous System and of the Organs of Special Sense	81	138	36	34	13	289	...
,, 3.—Diseases of the Circulatory System	106	137	8	59	22	310	...
,, 4.—Diseases of the Respiratory System	454	81	6	91	24	632	...
,, 5.—Diseases of the Digestive Organs	1,153	235	43	64	53	1,495	...
,, 6.—Diseases of the Genito-Urinary System and Adnexa	350	320	38	80	25	788	...
,, 7.—Diseases of the Puerperal Condition	677	54	9	30	17	770	...
,, 8.—Diseases of the Skin and of the Cellular Tissue	231	60	1	6	12	298	...
,, 9.—Diseases of the Organs of Locomotion	57	61	8	6	27	132	...
,, 10.—Malformation	9	9	5	5	1	28	...
,, 11.—Infancy	...	...	...	...	...	...	...
,, 12.—Old Age	...	...	...	...	...	...	...
,, 13.—Violence	181	47	8	10	18	246	...
,, 14.—Ill-defined Diseases	51	5	2	...	4	58	...
Grand Total	7,104	2,135	257	601	657	10,097	...

TABLE VIII.—Operations performed during 1926.

NOTE.—" Recovered " means lived for at least ten days after operation.

	Recovered.		Died.		Total.
	Male.	Female.	Male.	Female.	
1. *Alimentary.*					
Repair of hare-lip	4	...	...	...	4
,, cleft palate	2	3	...	...	5
Oesophagoscopy	1	1	...	...	2
Removal of bone from oesophagus	...	1	...	...	1
Gastrostomy	2	...	...	1	3
Gastro-enterostomy	25	6	...	...	31
Removal of foreign body from stomach	1	1	...	...	2
Laparotomy	26	21	3	3	53
Oversewing gastric ulcer	2	...	1	...	3
Oversewing duodenal ulcer	1	1	...	...	2
Pyloro-plasty	...	1	...	...	1
Removal of foreign body from bowel	...	1	...	...	1
Enterostomy	...	...	1	1	2
Cholecystectomy	3	30	...	1	34
Cholecystostomy	5	13	...	...	18
Cholelithotomy	3	7	1	...	11
Choledochotomy	...	1	...	...	1
Cholecystenterostomy	2	...	1	...	3
Appendicectomy	119	167	...	1	287
Draining abscess	11	24	...	1	36
Colostomy	9	4	...	3	16
Cæcostomy	...	1	...	2	3
Drainage, abdominal hydatid	2	1	...	...	3
Fistula in ano	11	3	...	...	14
Fissure in ano	...	4	...	...	4
Sigmoidoscopy	1	1	...	...	2
Hernia—					
Inguinal	58	...	1	...	59
Femoral	2	3	...	1	6
Umbilical	2	4	...	...	6
Inscisional	4	7	...	...	11
Dilatation rectal stricture	...	1	...	...	1
Bowel resection for intussusception	1	...	...	...	1
	297	307	8	14	626
2. *Genito-urinary.*					
Nephrotomy	...	1	...	...	1
Nephrectomy	1	2	...	...	3
Nephrolithotomy	2	1	...	...	3
Uretero-lithotomy	1	1	...	...	2
Urethral calculus	1	...	...	...	1
Supra-pubic cystotomy	6	...	...	...	6
Diathermy to bladder	5	1	...	...	6
Cystoscopy	57	50	...	...	107
Litholapaxy	...	1	...	...	1
Prostatectomy	10	...	...	...	10
Varicocele	6	...	...	...	6
Hydrocele	13	...	...	...	13
Orchidectomy	2	...	...	...	2
Circumcision	35	...	...	...	35
	139	57	...	...	196
2A. *Gynæcological.*					
Colpo-perineorrhaphy	...	11	...	...	11
Colpotomy	...	20	...	...	20
Trachelorrhaphy	...	4	...	...	4
Diathermy to cervix uteri	...	1	...	...	1
Insertion of radium in cervix uteri	...	5	...	...	5
Curettage uteri	...	608	...	6	614
Curettage cervix uteri	...	4	...	...	4
Cauterizing cervix uteri	...	1	...	...	1
Hysterectomy	...	29	...	...	29
Internal shortening	...	19	...	...	19
External shortening	...	3	...	...	3
Salpingostomy	...	1	...	...	1
Salpingectomy	...	28	...	...	28
Salpingo-oophorectomy	...	57	...	...	57
Oophorectomy	...	5	...	...	5
	...	796	...	6	802
3. *Cellular and Cutaneous.*					
Excision of ulcer	1	...	...	...	1
Incision	104	78	...	...	182
Avulsion of nail	3	11	...	...	14
Excision of cyst	9	5	...	...	14
Excision of warts	3	3	...	...	6
Removal of needle from hand	...	4	...	...	4
Removal of needle from foot	...	1	...	...	1
Removal of foreign body from lip	1	...	...	...	1
Removal of needle from chest	1	...	...	...	1
Excision of sinus	4	...	...	...	4
Plastic on hand	1	...	...	...	1
Curettage of sinus	1	...	...	...	1
Skin graft	3	2	...	...	5
	131	104	...	...	235
4. *Osseous and Arthritic.*					
Osteotomy	12	3	1	...	16
Sequestrectomy	15	...	...	1	16
Bone graft	1	...	...	...	1
Astragalectomy	1	...	...	...	1
Excision of coccyx	...	1	...	...	1
Excision of semi-lunar cartilage	2	1	...	...	3
Amputation of finger	3	...	...	...	3
Amputation of arm	1	1	...	...	2
Amputation stump of leg	1	...	...	...	1
Amputation of leg	4	...	...	...	4
Excision of dentigerous cyst	1	...	...	...	1
Suturing patella	...	1	...	...	1
Radical cure of hammer toes	...	1	...	...	1
Tendon suture	1	...	...	...	1
Excision of gangloin from wrist	...	2	...	...	2
Tenotomy	4	1	...	...	5
Reduction of dislocated shoulder	...	1	...	...	1
	46	12	1	1	60
5. *Respiratory.*					
Thoracotomy	20	12	...	...	32
Tracheotomy	1	...	...	...	1
Resection of nasal septum	12	5	...	...	17
Resection of turbinate bones	1	3	...	...	4
Removal of nasal polyp	7	3	...	...	10
Excision of ulcer of nose	1	...	...	...	1
Drainage hydatid of lung	...	1	...	...	1
	42	24	...	...	66
6. *Circulatory.*					
Excision of varicose veins	1	2	...	...	3
Hæmorrhoidectomy	25	7	...	...	32
	26	9	...	...	35
7. *Lymphatic and Glandular.*					
Tonsils and adenoids	84	107	...	...	191
Adenoids	12	9	...	...	21
Thyroidectomy	1	11	...	...	12
Splenectomy	...	1	...	...	1
Ruptured spleen	1	...	...	...	1
Excision of gland	8	3	...	...	11
	106	131	...	...	237
8. *New Growths.*					
Excision of lip and glands	7	...	...	...	7
Excision of epithelioma of skin	11	5	...	...	16
Excision of rodent ulcer	2	2	...	...	4
Excision of upper jaw	...	...	...	1	1
Excision of lower jaw	3	...	...	...	3
Excision of tongue and glands	6	...	...	...	6
Excision of tonsils and glands	2	...	...	...	2
Excision of carotid tumour	1	...	...	...	1
Excision of papilloma of larynx	1	...	...	...	1
Excision of carcinoma of bowel	1	3	1	...	5
Excision of malignant rectum	3	4	...	...	7
Excision of breast	1	16	...	...	17
Excision of carcinoma of breast & glands	...	5	...	...	5
Excision of lipoma	1	2	...	...	3
Excision of penis and glands	1	...	...	...	1
Excision of sarcoma of femur	...	1	...	...	1
	40	38	1	1	80
9. *Miscellaneous.*					
Paracentesis tympani	6	12	...	...	18
Excision of hyoid cyst	...	1	...	...	1
Draining frontal sinus	1	2	...	...	3
Draining mastoid antrum	11	9	...	...	20
Drainage of maxillary antrum	9	11	...	...	20
Curettage of mastoid sinus	1	...	...	...	1
Application plaster of Paris	12	3	...	...	15
Excision hydatid cyst	...	1	...	...	1
Examination under anesthetic	61	88	...	...	149
Cure of torticollis	...	1	...	...	1
Teeth extraction	2	1	...	...	3
Diathermy to lip	1	...	...	...	1
Diathermy to palate	...	1	...	...	1
Excision of ranula	1	...	...	...	1
Enucleation of eye	1	2	...	...	3
Removal of aural polypi	...	2	...	...	2
Trigeminal neurectomy	2	1	...	...	3
Plastic on jaw	1	...	...	...	1
Lumbar puncture	10	...	...	...	10
	119	135	...	...	254

TABLE VIII.—Operations performed during 1926—*continued.*

Summary of Operations.

	Recovered.		Died.		Total.
	Male.	Female.	Male.	Female.	
1. Alimentary	297	307	8	14	626
2. Genito-urinary	139	57	...	...	196
2A. Gynæcological	...	796	...	6	802
3. Cellular and cutaneous	131	104	...	...	235
4. Osseous and arthritic	46	12	1	1	60
5. Respiratory	42	24	...	...	66
6. Circulatory	26	9	...	...	35
7. Lymphatic and glandular	106	131	...	...	237
8. New growths	40	38	1	1	80
9. Miscellaneous	119	135	...	...	254
	946	1,613	10	22	2,591

Anaesthetics used.

Open ether, 326; kelene and open ether, 1,627; kelene, 176; chloroform and ether, 129; chloroform, 3; intrapharyngeal ether, 208; local anaesthetic, 103; spinal anaesthetic, 10; total, 2,582.

STATEMENT OF WORKING EXPENSES OF THE COAST HOSPITAL FOR THE YEARS 1925-26.

Table IX.—Maintenance and Treatment of Patients and Staff.

	1925.			Average.			1926.			Average.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
A. Salaries and Wages—												
1. Administrative	2,118	15	10				1,955	1	3			
2. Medical	4,171	17	7				3,923	15	9			
3. Clerical	2,610	1	0				2,068	8	7			
4. Dispensary	1,021	3	4				1,015	1	7			
5. Nursing	18,647	15	9				24,155	19	2			
9. Laundry	2,284	0	4				2,371	7	5			
10. Tradesmen and Mechanics	3,362	2	0				3,734	6	5			
11. Cleaning and General	9,397	0	3				10,611	12	5			
12. Farm and Garden	1,073	6	9				909	18	6			
13. X-ray	....						295	0	0			
	44,686	2	10	77	6	3	51,040	11	1	76	8	0
B. Provisions—												
1. Meat	4,764	16	0				3,303	18	3			
2. Milk	1,861	16	10				1,987	3	2			
3. Butter	1,769	1	1				2,155	14	11			
5. Bread and Flour	1,551	16	5				1,741	10	10			
6. Eggs	1,692	0	4				1,962	6	3			
7. Fish, fresh	1,061	15	1				1,052	19	3			
8. Poultry	1,074	1	0				1,289	5	2			
9. Groceries	3,898	7	8				5,213	18	10			
10. Vegetables and Fruit	1,442	15	3				2,059	3	2			
11. Malt Liquors	3	5	9				23	2	5			
12. Ice	31	16	2				69	2	0			
13. Cream	288	4	2				257	8	11			
	19,439	15	9	33	12	6	21,115	13	2	31	12	1
C. Drugs and Surgical Appliances—												
. Drugs, &c.	4,605	18	9				5,253	7	10			
2. Dressings and Bandages	334	8	2				338	5	8			
3. Surgical Appliances, Renewals	489	3	0				463	11	7			
4. Surgical Instruments, Renewals	360	13	8				188	12	2			
5. Stimulants	327	4	1				332	7	4			
	6,017	7	8	10	8	3	6,576	4	7	9	16	11
D. Fuel, Light, and Power—												
1. Coal, Coke, and Wood	3,558	2	7				3,373	4	1			
4. Electricity	1,696	15	8				1,609	9	11			
5. Electrical Fittings, Renewals	210	0	0				175	9	3			
	5,464	18	3	9	9	0	5,158	3	3	7	14	1
E. Domestic—												
1. Bedding and Bed Linen	1,050	12	0				2,292	19	10			
2. Clothing	694	14	8				1,492	19	11			
3. Drapery	695	16	10				945	17	2			
4. Uniforms	406	5	3				515	11	8			
5. Renewals of Furniture	74	8	5				182	9	9			
6. Ironmongery and Cutlery, &c.	513	15	11				347	3	3			
7. Brushware, Earthenware, &c.	308	15	4				403	8	7			
8. Laundry Materials	659	16	8				379	18	9			
	4,404	5	1	7	12	2	6,560	8	11	9	16	5
F. Printing and Stationery—												
1. Printing and Stationery	384	17	5				486	1	1			
3. Postage	86	10	0				76	15	0			
	471	7	5	0	16	4	562	16	1	0	16	10
G. Maintenance of Buildings and Grounds—												
1. Ordinary Repairs and Alterations	517	9	0				498	2	3			
2. Roadways and Grounds	49	16	2				47	14	5			
	567	5	2	0	19	8	545	16	8	0	16	5
J. Miscellaneous—												
1. Rates and Taxes	....						....					
2. Insurance	196	0	8				203	3	10			
3. Burials and Coffins	79	13	5				26	12	6			
4. Telephones	363	14	3				417	12	0			
7. Petty Expenses	256	8	7				372	0	8			
8. Unclassified	772	17	11				883	19	11			
	1,668	14	10	2	17	10	1,903	8	11	2	17	1
K. Extraordinary Expenditure—												
1. Surgical Instruments	....						161	9	8			
2. Appliances	17	2	11				60	0	0			
3. Machinery	8	10	3				14	19	8			
4. New Furniture	263	0	0				34	8	10			
5. New Buildings and Additions	....						....					
6. Miscellaneous	....						....					
7. Drapery	....						....					
8. Ironmongery	....						....					
9. Brushware	....						....					
10. Bedding and Bed Linen	....						....					
11. Special Repairs	....						....					
	288	13	2	0	10	0	270	18	2	0	8	1

TABLE IX.—Maintenance and Treatment of Patients and Staff—*continued.*

	1925.	Average.		1926.	Average
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
L. Special Department—					
1. X Ray	179 12 6			365 15 8	0 11 0
	179 12 6	0 6 5		365 15 8	
M. Farm and Garden, Live Stock, &c.—					
1. Purchase of Horses and Cows	195 0 0			83 1 0	
2. Purchase of Fodder	1,459 1 2			2,099 13 3	
3. Miscellaneous	57 7 9			289 11 0	
	1,711 8 11	2 19 0		2,472 5 3	3 14 0
Total Expenditure	84,899 11 7	146 17 5		96,572 1 9	144 10 11
Add value of goods received from other Institutions	9 7 10			4 9 6	
	84,908 19 5			96,576 11 3	
Deduct value of goods supplied to other Institutions	17 14 3			....	
	84,891 5 2			96,576 11 3	
Add value of Stock on hand, 31st Dec., 1924	5.079 8 5		1925	5,510 5 4	
	89,970 13 7			102,086 16 7	
Deduct value of Stock on hand, 31st Dec., 1925	5,510 5 4		1926	6,054 1 9	
	84,460 8 3			96,032 14 10	
Deduct Extraordinary Expenditure, Cost of Out-door Patients, &c.	1,527 18 2			1,879 5 1	
	82,932 10 1			94,153 9 9	
Average cost per occupied bed, General and Infectious Division, based on upkeep Expenditure	....	143 9 2		....	140 18 7
Deduct Collections paid to Revenue	6,777 7 7	....		8,312 8 6	....
	76,155 2 6	....		85,841 1 3	....
Net cost per occupied bed, General and Infectious Division	....	131 14 10		....	123 9 9

TABLE X.—Amount expended from the Vote of the Public Works Department not included in the foregoing statistics

	1925.		1926.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Roads and Footpaths—				
Repairs	18 17 10	....	....	....
Construction	....	....	....	....
Total	18 17 10	18 17 10	....	....
Fencing—				
La Perouse—House	....	....	....	....
Total	....	....	....	....
Steam and Hot Water Services—				
Repairs—Steam and Hot Water Services	434 6 1	....	506 13 6	....
Repairs and Renewals of Boilers	42 18 0	....	19 6 7	....
Hot Water Services	184 13 2	....	219 16 0	....
Rebuilding Chimney Flues	....	....	18 3 11	....
Repairs to Tank Stand	....	....	....	....
Total	661 17 3	661 17 3	764 0 0	764 0 0
Cold Storage—				
Refrigerating Plant	....	....	....	....
Total	....	....	....	....
Electric Light and Power Service—				
Electric Maintenance	....	....	183 12 0	....
Light and Power Mains	33 0 0	....	....	....
Total	33 0 0	33 0 0	183 12 0	183 12 0
General—				
Repairing Laundry Plant	....	....	220 0 0	....
Repairs and Renovations of Buildings	3,034 2 4	....	1,610 17 4	....
Cooking Plant	30 4 7	....	....	....
Repairs to Dam	....	....	....	....
Repairs—Fire Services	10 0 0	....	....	....
Erection, Herdsman's Cottage	998 9 1	....	45 0 0	....
Repairs—Tennis Court	....	....	....	....
,, Sewerage	67 2 1	....	....	....
Repairs and Extensions Water Service	121 5 6	....	712 7 8	....
Boosting Plant	....	....	....	....
New Buildings and Additions	....	....	153 2 8	....
Total	4,261 3 7	4,261 3 7	2,741 7 8	2,741 7 8
X-Ray Plant—				
Electrical Appliances and X-Ray Plant	296 9 8	....	....	....
Testing X-Ray Apparatus	....	....	....	....
Conversion of old office into X-Ray Department	....	....	....	....
	296 9 8	296 9 8	....	....
Grand Total £	....	5,271 8 4	3,688 19 8	3,688 19 8

TABLE XI.—SUMMARY TABLE, showing the work of the Coast Hospital and its cost each year, from 1884 to 1926

Year.	No. of Patients admitted.	Average residence of discharged patients in days.	Rate of Mortality on cases treated.	Infectious Diseases included in foregoing columns.																						Average daily number.	Cost per occupied bed.	Wines, spirits, &c., cost per head (included in foregoing columns).
				Typhoid Fever.		Variola.		Measles.		Scarlet Fever.		Whooping Cough.		Diphtheria.		Influenza.		Plague.		Erysipelas.		Other Epidemic Diseases.						
				Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.		£ s. d.	£ s. d.
1884	1,132	29·33	4·04	235	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	104·33	58 1 1¼	2 3 2½
1885	1,204	37·06	7·05	285	50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	150·05	51 16 8	1 11 2¾
1886	1,278	41·06	9·38	392	53	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	146·33	52 0 8	1 10 0¾
1887	1,726	42·05	9·21	286	36	...	...	18	...	43	...	...	...	...	...	...	...	...	...	...	...	1	...	198·56	42 14 1½	0 10 9¼
1888	1,694	42·23	5·55	241	15	...	...	33	...	52	...	...	...	1	...	...	...	...	...	45	...	3	...	197·12	41 13 2	0 8 8
1889	1,813	39·09	5·44	342	24	...	...	10	1	21	...	36	2	7	2	...	...	...	...	52	2	2	...	198·09	44 17 4¾	0 6 4¼
1890	1,529	42·00	7·03	140	21	...	...	5	...	14	...	19	...	1	...	...	...	...	...	19	...	7	...	178·00	55 7 5	0 5 11
1891	1,748	40·00	3·23	88	8	...	...	1	...	22	...	25	2	4	...	...	...	...	...	31	...	7	...	193·00	50 2 6	0 5 2¾
1892	1,644	44·06	4·04	61	10	...	...	2	...	39	...	29	2	6	3	...	...	...	...	24	...	16	...	200·03	44 17 11¼	0 7 6½
1893	2,274	32·08	4·05	83	10	...	...	281	8	195	12	7	...	9	3	...	...	...	...	36	...	7	...	193·05	47 8 0	0 10 1
1894	2,158	27·06	4·03	143	12	...	...	7	1	118	9	28	3	9	3	...	...	...	...	36	3	26	...	176·01	55 7 4¼	1 3 6¾
1895	2,451	24·06	3·07	96	6	...	...	1	...	60	...	25	1	45	1	...	...	...	...	51	...	10	...	176·03	59 1 11	1 1 6¾
1896	2,213	31·03	5·04	236	19	...	...	2	...	61	2	3	...	11	1	...	...	...	...	63	...	1	...	204·06	51 6 1¾	1 4 4
1897	2,307	32·06	5·05	128	11	...	...	...	...	235	3	...	...	25	...	...	...	...	...	100	7	6	...	224·01	50 19 2½	1 9 10
1898	2,694	31·04	5·38	163	18	...	...	319	15	350	7	...	...	27	4	...	...	...	...	70	2	...	...	231·00	64 14 10¾	1 14 3¼
1899	2,359	36·30	4·79	148	13	...	...	10	...	134	2	42	10	25	2	...	...	...	...	54	...	8	...	224·25	73 10 11¾	1 13 10
1900	2,513	30·10	5·20	247	25	...	...	29	...	116	2	2	...	7	2	...	...	...	...	33	2	4	...	214·40	72 18 8¼	1 8 2¾
1901	2,688	31·24	5·75	214	21	...	...	131	1	150	5	15	...	65	4	...	...	...	...	49	5	11	...	255·50	59 4 3½	0 16 1½
1902	2,672	30·94	6·29	144	5	...	...	73	...	313	20	26	...	64	5	...	...	128	26	109	8	6	...	256·85	66 9 4¼	0 13 10¼
1903	3,359	31·72	4·67	166	20	...	...	62	1	585	21	13	3	92	...	...	...	2	...	84	6	16	1	300·76	61 17 11½	0 5 2¾
1904	3,439	30·94	5·17	178	24	...	...	81	1	371	11	40	4	301	11	...	...	10	4	113	5	44	...	305·16	63 2 11¼	0 7 8¼
1905	3,298	31·81	5·20	139	20	...	...	43	1	284	6	1	...	313	10	...	...	16	4	100	6	7	...	289·32	59 12 0¾	0 8 4
1906	2,965	37·03	3·56	84	7	...	...	55	...	503	11	...	...	267	9	...	...	15	4	80	4	3	...	308·67	56 13 1½	0 4 0½
1907	3,051	37·16	5·93	101	12	...	...	157	5	336	5	93	20	389	23	...	...	41	11	58	...	...	...	307·41	58 17 8¼	0 4 5¼
1908	3,147	32·89	5·44	114	13	...	...	17	1	420	10	6	1	360	11	...	...	7	2	62	7	...	...	306·83	61 11 5	0 4 0¾
1909	2,971	31·13	5·53	96	8	...	...	55	...	339	6	4	...	500	12	...	...	22	7	72	3	...	...	295·33	63 5 4½	0 4 1¾
1910	3,538	30·52	5·39	85	7	...	...	189	12	150	6	74	15	909	18	...	...	...	...	40	3	41	...	312·66	62 2 0¾	0 2 5¼
1911	3,474	29·19	5·32	66	8	...	...	70	...	134	...	67	12	974	24	...	...	...	...	48	4	...	...	322·62	64 0 1¼	0 4 0½
1912	4,170	29·54	5·76	67	8	...	...	475	46	108	4	29	5	1284	36	...	...	...	...	73	8	5	...	335·45	77 15 1½	0 4 1¾
1913	3,702	31·83	5·13	77	10	4	...	93	...	287	7	64	14	994	28	...	...	...	...	48	5	22	...	335·51	87 6 6¼	0 3 3¼
1914	4,032	32·35	3·81	73	12	6	...	82	1	628	7	36	4	977	10	...	...	...	...	34	1	20	...	373·11	74 7 5	0 1 0½
1915	4,806	30·09	4·12	123	10	22	...	357	2	1279	19	4	...	925	35	...	...	...	...	42	8	12	3	440·00	69 5 7	0 2 3½
1916	4,618	32·29	3·07	59	8	14	...	206	1	835	22	53	9	1101	32	...	...	...	...	55	1	244	...	447·00	77 4 11	0 4 1¼
1917	4,320	36·49	3·73	16	2	4	...	147	6	498	4	21	4	1328	11	...	...	...	...	79	7	207	...	433·12	94 10 9	0 4 4
1918	4,556	39·60	4·20	31	6	1	...	323	13	314	9	63	8	1251	13	...	...	...	...	92	10	38	...	513·41	98 12 2	0 4 8
1919	5,556	20.67	8·13	25	1	1	...	62	3	213	5	20	1	571	10	2,966	313	...	...	66	2	20	...	385·2	159 0 4	0 8 3
1920	5,945	29·72	7·37	61	5	...	...	581	62	212	1	130	18	904	14	83	...	...	...	86	13	44	...	477·62	159 0 0	0 5 7
1921	6,450	29·3	5·6	49	12	...	...	36	4	174	...	40	4	1360	15	215	16	1	1	102	4	52	...	522·3	156 17 8	0 7 7
1922	6,894	27·54	5·6	33	15	...	...	163	5	229	3	37	2	905	11	118	1	29	6	109	7	514	3	520·16	149 12 4	0 5 8
1923	8,289	34·38	6·37	48	5	...	...	642	35	607	3	32	5	855	13	170	3	...	...	195	12	258	...	563·47	141 10 2	0 13 2
1924	8,171	24·35	5·31	51	4	...	...	85	...	1024	9	39	7	1107	16	158	1	...	...	111	4	79	...	575·29	153 1 1	0 13 0
1925	8,458	23·61	6·41	50	4	...	...	252	11	842	12	89	11	787	3	94	...	...	...	98	4	43	3	578·06	143 9 2	0 11 3
1926	10,175	23·74	5·9	60	4	...	...	701	35	1668	38	46	5	1018	13	251	5	...	...	76	5	62	...	668·09	140 18 7	0 9 10

2.—LEPER LAZARET.

THIRTY-SIXTH REPORT ON LEPROSY IN NEW SOUTH WALES, FOR THE YEAR ENDED 31st DECEMBER, 1926.

The Medical Superintendent of the Coast Hospital to the Director-General of Public Health.

The Coast Hospital, Sydney, N.S.W.

Sir,

On 1st January, 1926, 17 persons remained under detention at the lazaret. (*See* Appendix A.)

During the year 1 person was admitted as being a suspected leper. He was placed under observation on 8th May and discharged on 21st July, 1926.

One death occurred during the year, viz., C. T., admitted in 1886 (Case XVII).

There was 1 discharge during the year, viz , H. P., admitted in 1925 (Case CLXX).

The total number of persons admitted since 1883, when patients first began to be received (though the notification of leprosy was first made compulsory and the detention of lepers provided for by law only towards the end of 1890), is 171.* Distributed under nationalities, the account stands as follows:—

	Admitted.	Re-admitted.	Discharged.	Repatriated.	Died.	Remaining in at 31 Dec., 1925.
Whites, of European descent—						
New South Wales	43	1	15	......	24	5
Victoria	2	......	......	......	1	1
Queensland	2	......	1	......	1	......
Northern Territory	1	......	1	......	......	......
New Zealand	1	......	......	......	1	......
Fiji	2	......	1	......	1	......
England	12	......	3	......	8	1
Ireland	8	......	2	......	5	1
Scotland	1	......	1	......	......	......
Germany	4	......	1 absconded.	1	2	......
Belgium	1	......	......	......	1	......
U.S. America	1	......	......	......	1	......
Greece	2	......	......	1	......	1
Malta	2	......	1 absconded.	......	1	......
Sweden	1	......	......	......	......	1
France	1	......	......	......	1	......
Coloured patients—						
New South Wales	2	......	1	......	......	1
West Indies	1	......	1 (in 1885).	......	......	......
India	4	......	1 absconded.	1	2	......
China	56	......	2	33	19	2
Java	1	......	......	......	1	......
New Caledonia	1	......	......	......	1	......
Pacific Island	1	......	......	5	11	2
Egypt	1	......	......	1	......	......
Zanzibar	1	......	1 (to Hong Kong at own request).	......	......	......
Syria	2	......	1	1	......	......
	171	1	33	43	81	15

* This is the number of persons admitted; it does not agree with the highest number given in Appendix B in Roman numerals, which indicates the number of cases observed, whether admitted or merely described and recorded.

Thus the number remaining in the lazaret on 31st December, 1926, was 15 persons; 11 males and 4 females.

Appendix A shows particulars of each case under detention since the year 1883, and in Appendix B are given the usual notes of the new patients received during 1926, of patients discharged or died during the year, and a survey of the condition of patients remaining in at the end of the year.

43531—N

Every opportunity has been offered to members of the medical profession to visit the lazaret for the purpose of seeing such patients as were formerly under their care, or for study of the disease.

The following statements show the expenditure for the year, and the sources from which it has been defrayed :—

STATEMENT showing the Working Expenses of the Lazarets (for men and for women) at Little Bay for the year 1926.

	£	s.	d.
Salaries	1,840	15	0
Provisions	718	15	6
Fruit and vegetables	80	10	5
Uniforms, clothing, &c.	115	2	4
Printing and stationery	5	5	0
Fuel and light	260	8	4
Wines, ales, &c.	19	16	11
Ironmongery, brushware, &c.	10	1	2
Drugs	102	18	8
Sundries	214	18	10
	£3,368	12	2

Average number of patients resident, 16·5, being equal to an average of £204 3s. 2d. per inmate per annum.

STATEMENT showing the total Expenditure of the Lazarets (for men and for women) at Little Bay during the year 1926, and from what sources the amounts were paid.

EXPENDITURE.	£	s.	d.	HOW PAID.	£	s.	d.
To working expenditure, as per statement.	3,368	12	2	From vote—Maintenance of lepers by Department of Public Health	2,508	4	9
				Transfers from Coast Hospital stock	860	7	5
Total ....£	3,368	12	2	Total ....£	3,368	12	2

AMOUNT expended from the Vote of the Public Works Department not included in the foregoing statistics.

1926.

	£	s.	d.	£	s.	d.
Electric Light and Power Service— Electrical Maintenance	140	0	0	....		
	140	0	0	140	0	0
General— Repairs and Renovations of Buildings............	1,253	5	7	....		
Renewal Fire Service	179	0	0	....		
	1,432	5	7	1,432	5	7
Grand total	£1,572	5	7	1,572	5	7

The needs of the patients have been carefully supplied by experienced attendants and nurses, under direct supervision of the Medical Superintendent and the Matron of the Coast Hospital, and, as in the past, every means have been adopted to alleviate their sufferings and to mitigate the hardships of their detention.

I have, &c.,
R. J. MILLARD,
Medical Superintendent.

APPENDIX A.

RETURN showing Particulars of Lepers detained at Little Bay, New South Wales, since the year 1883.

Name.	Sex.	Native of—	Occupation.	Admission.		Where from.	No. of Case in Clinical Notes.	Died or Discharged.
				Age on	Date of			
A.H. ...	Male ...	China	Gardener	42	19 April, 1883	Parramatta Asylum	....	Died, 15 May, 1886.
J.H. ...	" ...	"	"	32	19 " "	" ...	....	Died 27 June, 1886.
A.H. ...	" ...	"	"	34	12 June, "	" ...	....	Died, 20 April, 1886.
A.M. ...	" ..	"	Butcher	32	28 Oct., "	Tenterfield	XIV	Returned to China, 14 Aug., 1896.
A.P. ...	" ...	"	Storekeeper	27	28 " "	Willow Creek	XV	
G.H. ...	" ...	"	Labourer	37	27 " 1884	Sydney	....	†Died, 24 Dec., 1886.
K.K. ...	" ...	"	"	24	21 Dec., "	Bathurst	....	Died, 28 April, 1885.
J.B. ...	" ...	West Indies ...	"	51	22 Sept., 1885	Bermagui	....	‡Discharged, 29 Dec., 1885.
A.Y. ...	" ...	China	Gardener	29	23 Dec., "	Sydney	....	Died, 6 Feb., 1890.
C.B. ...	" ...	"	"	32	29 Jan., 1886	Alexandria	XVI	Returned to China, 14 Aug., 1896.
A.S. ...	" ...	"	Tin-miner	42	20 Feb., "	Cooper's Creek	....	Died, 12 Nov., 1890.
C.T. ...	" ...	Java	Groom	24	14 Aug., "	Castle Hill, Parramatta.	XVII	Died, 8 Sept., 1926.
A.L. ...	" ...	China	Gardener	44	20 May, 1887	Bathurst	....	Died, 12 April, 1891.
Y.S. ...	" ...	"	Carpenter	31	20 April, 1888	Sydney	XVIII	Returned to China, 14 Aug., 1896.
*F.G. ...	" ...	N.S.W.	Plasterer	27	21 Aug., "	"	I	Died, 25 Sept., 1892.
A.Y. ...	" ...	China	Gardener	29	30 Sept., "	Inverell	XIX	Returned to China, 14 Aug., 1896.
L.P. ...	" ...	"	Carpenter	18	22 Dec., "	Sydney	XX	
H.K. ...	" ...	"	Miner	28	23 Mar., 1889	Enfield	XXI	
*H.B. ...	" ...	N.S.W.	"	17	17 Dec., "	Mudgee	II	Died, 13 May, 1894.
*H.R. ...	" ...	"	Labourer	28	8 Aug., 1890	Richmond River ...	III	Died, 29 May, 1901.
*A.G. ...	" ...	"	Schoolboy	14	18 " "	Balmain	IV	Discharged 1/5/95. Died 21/7/25.
*E.U. ...	" ...	"	Labourer	23	16 Jan., 1891	Sydney	V	Died, 1 May, 1898.
*H.S. ...	" ...	"	Mariner	41	23 " "	Newtown	VI	Died, 4 Feb., 1891.
A.L. ...	" ...	China	Gardener	30	26 Feb., "	Newcastle	XXIII	Died, 28 Dec., 1895.
*M.R. ...	Female	N.S.W.	Domestic duties ...	33	§11 Mar., "	Surry Hills	VII	Died, 20 June, 1892.
T.W. ...	Male ...	China	Cook	29	6 Aug., "	Narrandera	XXV	Returned to China, 14 Aug. 1896.
W.C. ...	" ...	"	Labourer	40	27 " "	Sydney	XXIV	
A.H. ...	" ...	"	Storekeeper	25	18 Sept., "	Mudgee	XXII	
J.L. ...	" ...	Tanna	Labourer	25	8 Dec., "	Clarence River	XXVI	Died, 7 May, 1901.
*R.W. ...	" ...	N.S.W.	Carpenter	47	24 " "	Narrabri	VIII	Died, 27 Mar., 1896.
*I.L. ...	Female	"	Domestic duties ...	53	§18 " "	Waverley	IX	Died, 16 June, 1899.
A.S. ...	Male ...	China	Cabinetmaker	28	21 April, 1892	Sydney	XXVII	Died, 29 June, 1897.
*C.D. ...	" ...	N.S.W.	Carpenter	24	30 " "	Gunnedah	X	Died, 17 Aug., 1900.
S.P. ...	" ...	England	Commercial traveller	49	7 June, "	Sydney	XI	Died, 28 May, 1898.
H.G. ...	" ...	China	Wood-cutter	47	19 Sept., "	"	XXVIII	Returned to China, 14 Aug., 1896.
M.E.K.	Female	N.S.W.	Domestic duties ...	43	21 " "	North Sydney	XII	Died, 23 July, 1897.
L.P.H.	Male ...	China	Gardener	44	12 Oct., "	Manly	XXIX	Returned to China, 14 Aug., 1896.
W.W. ...	" ...	Fiji	Schoolboy	13	27 " "	Sydney	XIII	Died, 26 Jan., 1901.
A.L. ...	" ...	China	Gardener	35	3 Nov., "	Bombala	XXXI	Returned to China, 17 July, 1897
A.Q. ...	" ...	"	Dealer	39	15 " "	"	XXXII	Returned to China, 14 Aug., 1896.
J.C. ...	" ...	"	....	38	29 " "	Sydney	XXXIII	Died, 2 Aug., 1893.
A.G. ...	" ...	"	Labourer	26	7 Dec., "	Parramatta	XXX	Returned to China, 14 Aug., 1896.
G.Y. ...	" ...	"	Cook	68	31 " "	Sydney	XXXIV	
A.P. ...	" ...	"	Hawker	33	21 Jan., 1893	Parramatta	XXXV	
M.M. ...	Female	New Zealand...	....	24	27 Feb., "	Fiji	XXXVI	Died, 10 Sept., 1895.
A.T. ...	Male ...	China	Bushman	28	15 April, "	Cooma	XXXVII	Returned to China, 14 Aug., 1896.
*N.G. ...	" ...	N.S.W.	Miner	61	21 " "	Parramatta Asylum	XXXVIII	Died, 4 April, 1896.
*A.M. ...	Female	"	Housewife	35	7 Sept., "	Balmain	XXXIX	Died, 13 Mar., 1896.
P.M. ...	Male ...	India	Hawker	47	3 Nov., "	Newcastle	XL	Died, 22 Mar., 1899.
*E.R. ...	Female	N.S.W.	Domestic duties	16	18 " "	West Maitland	XLI	Died, 21 Sept., 1900.
C.H.M.	Male ...	Germany	Station overseer	65	25 Jan., 1894	Sydney	XLII	Died, 8 July, 1898.
‖W.H.D...	" ...	Queensland ...	....	21	18 April, "	"	XLIII	Died, 29 Nov., 1896.
G.N. ...	" ...	New Caledonia	Pearl-diver	20	16 July, "	"	XLIV	Died, 1 Sept., 1895.
*H.J.T....	" ...	N.S.W.	Bushman	52	10 Oct., "	"	XLV	Discharged, 5 Sept., 1902.
K.J. ...	" ...	India	Hawker	30	30 Nov., "	"	XLVI	Died, 2 Aug., 1895.
J.T. ...	" ...	England	Labourer	70	4 April, 1895	Coast Hospital	XLVIII	Died, 6 Nov., 1897.
T.O'R.	" ...	Ireland	"	70	2 Oct., "	Sydney	LIII	Died, 8 Nov., 1895.
W.F. ...	" ...	"	Clerk	40	8 " "	"	LII	Died, 8 Nov., 1896.
H.J. ...	" ...	China	Hawker	31	21 Jan., 1896	Coast Hospital	LV	Returned to China, 14 Aug., 1896.
H.Y. ...	" ...	"	Gardener	26	4 Feb., "	"	LIV	
A.T. ...	" ...	"	"	31	25 Dec., "	Oxley	LVI	Returned to China, 17 July, 1897.
F.R. ...	" ...	Belgium	Mechanic	55	16 Feb., 1897	Coast Hospital	LVIII	Died, 23 June, 1897.
H.W. ...	" ...	U.S.A.	Mariner	57	12 Nov., "	Lord Howe Island. .	LIX	Died, 14 May, 1911.
*W.W. ...	" ...	N.S.W.	Labourer	19	26 Feb., 1898	Wollongong	LXI	Died, 21 Feb., 1900.
*A.B. ...	" ...	"	"	20	22 Mar., "	Gunnedah	LXIV	Died, 7 July, 1901.
*R.C. ...	" ...	"	Butcher	27	9 July, "	Wollongong	LXII	Died, 30 April, 1903.
A.G. ...	Female	China	Housewife	38	23 Sept., "	Waterloo	LXVI	Died, 4 Feb., 1901.
*J.F.D. ..	Male ...	N.S.W.	Labourer	26	11 July, 1899	Lismore	LXVII	Died, 30 Mar., 1907.
C.P. ...	" ...	China	Sculleryman	22	14 April, 1900	Sydney	LXVIII	Died, 16 May, 1903.
B.A. ...	" ...	Aoba Island ...	Labourer	35	26 Feb., 1901	Murwillumbah	LXIX	Returned to Aoba, 1 Dec , 1902.
C.T. ...	Female	Germany	Housewife	29	23 April, "	Lismore	LXX	Died, 14 Dec., 1903.
*D.N. ...	Male ...	N.S.W.	Labourer	18	4 June, "	Glen Innes	LXXI	Died, 28 Feb., 1905.
J.S.	" ...	"	Farmer	52	20 " "	Miller's Forest	LXXII	Discharged, 28 Feb., 1902.
*D.L. ...	" ...	England	Labourer	46	20 " "	Rookwood Asylum	LXXIII	Died, 15 Dec., 1902.
F.H. ...	" ...	"	Seaman	75	4 July, "	Sydney	LXXIV	Died, 5 July, 1905.
A.R. ...	" ...	China	Labourer	25	30 Oct., "	"	LXXV	Returned to Hongkong, 6 Aug., 1904.
A.T. ...	" ...	"	"	35	4 Dec., "	"	LXXVI	
G.Y. ...	" ...	"	Miner	...	8 Jan., 1902	"	LXXVII	Died, 17 Jan., 1902.
*J.G. ...	" ...	N.S.W.	Grazier	57	13 " 1903	"	LXXVIII	Died, 31 Aug., 1904.
M.S. ...	" ...	Ireland	Miner	45	20 Feb., "	Parramatta Asylum	LXXIX	Died, 19 Feb., 1908.
F.H.L.	" ...	China	Gardener	32	10 Mar., "	Enfield	LXXX	Returned to Hongkong, 6 Aug., 1904.
G.M. ...	" ...	England	Farmer	52	7 April, 1903	Cudgen	LXXXI	Discharged, 31 Mar., 1909.

* These are all natives of New South Wales of European descent. † This patient was transferred to a Hospital for the Insane on 2nd April, 1885, where also his death occurred. ‡ See note * to Appendix A. § Date of report. These patients were afterwards removed to Little Bay. ‖ Of European descent.
Patients remaining under treatment have their initials shown in black-faced type.

RETURN showing Particulars of Lepers detained at Little Bay, New South Wales, since the year 1883—*continued.*

Name.	Sex.	Native of—	Occupation.	Admission.		Where from.	No. of Case in Clinical Notes.	Died or Discharged.
				Age on.	Date of.			
† F.C.	Male...	Fiji	School	17	7 April, ,,	Fiji	LXXXII	Discharged, 29 Mar., 1918
A.S.	,, ...	China	Wood-cutter	31	21 ,, ,,	Canterbury	LXXXIII	Returned to Hongkong, 6 Aug., 1904.
S.V.	,, ...	Zanzibar	Seaman	22	5 May, ,,	Sydney	LXXXIV	
T.B	,, ...	China	Cook	37	30 June, ,,	Canterbury	LXXXV	
W.M.	,, ...	Buka Buka	Labourer	36	3 Nov., ,,	Tweed River	LXXXVI	Died, 14th March, 1914
*F.E.B.	,, ...	N.S.W.	Drover	27	25 ,, ,,	,,	LXXXVII	
*G.M.S.	Female	,,	Housewife	19	9 Feb., 1904	Lismore	LXXXVIII	
*V.M.W.	,,	,,		17	31 Mar., ,,	Sydney	LXXXIX	Discharged, 11th Jan., 1915
D.D.	Male...	,,	Teamster	54	19 April, ,,	Botany	XC	Discharged, 20 Sept., 1909.
A.M.	,, ...	China	Farmer	24	3 May, ,,	Tumut	XCI	Returned to Hongkong, 6 Aug., 1904.
F.B.	,, ...	Mallicolo	Labourer	39	10 ,, ,,	Tweed River	XCII	Returned to native island, 9 May, 1908.
W.T.	,, ...	England		65	4 July, ,,	Sydney	XCIII	Discharged, 20 Sept., 1906.
G.W.	,, ...	China	Labourer	32	27 Sept., ,,	Narrabri	XCIV	Returned to Hongkong, 13 June, 1905.
*R.B.	,, ...	N.S.W.	Coach-painter	23	11 Oct., ,,	Newtown	XCV	Discharged, 22 March, 1912.
H.F.	,, ...	China	Miner	45	24 Jan., 1905	Emmaville	XCVI	Ret'd to Hongkong, 13 June, 1905.
S.M.	,, ...	Lifu	Labourer	66	7 Feb., ,,	Tweed River	XCVII	Died, 8 Jan., 1907.
A.S.	Female	Egypt	Housewife	38	7 Mar, ,,	Sydney	XCVIII	Returned to Egypt, 23 June, 1905.
T.H.	Male...	Ireland	Bullock-driver	65	11 July, ,,	Coast Hospital	XCIX	Discharged, 19 Dec. 1905. Readmitted 19 Aug., 1907. Again discharged, 22 Feb., 1919.
J.W.	,, ...	Tanna	Labourer	40	11 ,, ,,	Maclean	C	Died, 30 Oct., 1906.
T.A.	,, ...	Ambrym	,,	35	11 ,, ,,	,,	CI	
H.G.	,, ...	Gala	,,	35	14 Nov., ,,	Tweed River	CIII	Died, 18th Feb., 1915.
G.B.	,, ...	Vanua Lava	,,	38	9 Jan., 1906	,,	CV	Died, 31 Aug., 1912.
G.A.	,, ...	Ambrym	,,	35-40	15 Aug., ,,	,,	CVI	Returned to native island, 1 Dec., 1908.
A.M.	,, ...	China	Gardener	30	4 Sept., ,,	Nyngan	CVII	Returned to Hongkong, 9 Nov., 1906.
L.A.	,, ...	Ambrym	Labourer	35	9 Oct., ,,	Tweed River	CVIII	Returned to native island, 9 May, 1908.
C.B.	,, ...	China	Hawker	48	9 ,, ,,	Sydney	CIX	Returned to Hongkong, 9 Nov., 1906.
A.M.	,, ...	,,	Wood-cutter	58	9 ,, ,,	Glen Innes	CX	
W.D.	,, ...	Lifu	Gardener	30	20 Nov., ,,	Turramurra	CXI	Died, 2 April, 1910.
P.S.	,, ...	India	Hawker	35	19 Jan., 1907	Nowra	CXII	Absconded, 18 May, 1907.
C.S.C.	Female	Victoria		40	16 April, ,,	Maroubra	CXIII	
Ah J.	Male...	China	Hawker	40	17 Sept., ,,	Sydney	CXIV	Died, 14 May, 1924.
H.F.	,, ...	,,	Cabinet-maker	40	29 Oct., ,,	Warren	CXV	Died, 5 May 1913.
F.P.	,, ...	England	None	68	14 Jan., 1908	Sydney	CXVI	Died, 11 Aug., 1909.
A.R.	Female	N.S.W.	School	7	14 ,, ,,	Lismore	CXVII	
T.W.C.	Male...	,,	Farmer	45	18 Mar., 1909	Manilla	CXVIII	Died, 2 Nov., 1910.
P.J.	,, ...	Syria	Hawker	54	10 Nov., ,,	Yalgogrin	CXIX	Repatriated, 1 Feb., 1911.
A.Z.	,, ...	Greece	Sculleryman	17	11 Oct., 1910	Sydney	CXXII	Repatriated, 1 Feb., 1911.
J.C.	,, ...	England	Miner	48	15 Nov., ,,	,,	CXXIII	
J.A.	,, ...	Syria	Hawker	35	29 ,, ,,	,,	CXXIV	Discharged, 15th April, 1920.
C.M.	,, ...	Tonga	Gardener	45	8 June, 1911	North Sydney	CXXV	Died, 26 April, 1923.
T.L.	,, ...	China	Cabinet-maker	49		Botany	CXXVI	Died, 8 Oct., 1911 (before transfer)
M.B.	Female	Ireland	Teacher	33	7 Nov., 1911	Lismore	CXXVII	Died, 10th July, 1915.
S.C.	Male...	China	Cabinet-maker	40	21 May, 1912	Boolaroo, N.S.W.	CXXVIII	
L.J.T.	,, ...	N.S.W.	School	12	14 Aug., ,,	Lismore	CXXIX	Discharged, 21 July, 1916.
S.M.	,, ...	Mallicolo	Labourer	50	27 ,, ,,	Maclean	CXXX	Died, 23 April, 1919.
J.F.	,, ...	N.S.W.	Van-driver	28	19 Sept., ,,	Glebe	CXXXI	Discharged, 1 January, 1920.
W.D.	,, ...	,,	Fisherman	22	24 June, 1913	Ulladulla, S. Coast	CXXXII	Discharged, 10 Feb., 1921.
J.M.	,, ...	New Hebrides	Labourer	60	28 Nov., ,,	Tweed River	CXXXIII	Died, 17 March, 1917.
J.C.M.	,, ...	N.S.W.	Miner	26	28 Jan., 1914	Homeville, W. Maitland.	CXXXIV	Died, 17th June, 1915.
W.B.	,, ...	England	Dealer	33	4 Mar., ,,	Sydney	CXXXV	Died, 14th August, 1915.
A.C.P.	,, ...	N.S.W.	School	15	23 June, ,,	Lismore	CXXXVI	Discharged, 12 October, 1922. Re-admitted 16 Jan., 1925.
E.W.	,, ...	South Sea Islands	Labourer	50	17 Nov., ,,	Cudgen	CXXXVII	
H.H.	,, ...	England	Labourer	36	19 May, 1915	Hornsby	CXXXVIII	Died, 7 January, 1924.
A.D.	Female	New Hebrides	Domestic	19	1 Sept., ,,	St. Kilda, Victoria	CXXXIX	Died 18th July, 1923.
C.F.	Male...	China	Cabinet-maker	50	18 Dec., ,,	Waterloo, N.S.W.	CXL	Discharged, 10 March, 1917.
L.F.	,,	England	Showman	45	9 Mar., 1916	Campbelltown	CXLI	Discharged, 2 June, 1917.
F.H.	Female	China	Gardener	48	25 May, ,,	Sydney	CXLII	Died, 15 June, 1916.
D.M.	Male...	N.S.W.	Publican	46	25 ,, ,,	Armidale	CXLIII	Discharged, 19 May 1917.
W.J.P.	,,	,,	School	12	25 Nov. ,,	Lismore	CXLIV	Disch. 5 November, 1924.
E.L.P.	,,	,,	,,	11	25 ,, ,,	,,	CXLV	Died, 27 December, 1922.
E.M.	,,	Germany		56	3 April, 1917	Liverpool, N.S.W.	CXLVI	Repatriated as Prisoner of War, 27 May, 1919.
C.W.	,,	England		80	14 ,, ,,	Sydney	CXLVII	Died, 18 February, 1923.
C.D.	Female	N.S.W.	Domestic	54	30 Oct., ,,	Casino, N.S.W.	CXLVIII	Discharged, 12 June, 1920.
P.P.	Male..	Greece	Cafe-proprietor	33	21 Feb., 1918	Melbourne, Vic.	CXLIX	
J.C.	,,	Ireland	Miner	84	5 Feb., 1919		CL	Died, 19 November, 1920
M.T.	Female	Victoria	Housewife	63	25 Feb., ,,	Sydney	CL(A)	Died, 1 May, 1919.
J.P.	Male...	Malta	Labourer	29	18 June, ,,		CLI	Absconded, 14 Sept., 1919.
J.S.	,,	,,	,,	30	22 Dec., ,,	Kempsey	CLII	Died, 29 July, 1921.
A.S.	,, ..	China	Gardener	64	3 Aug., 1920	Kandos N.S.W.	CLIII	Died, 2 August, 1923.
C.T.P.	,, ...	,,	Labourer	30	19 Oct., ,,	Nauru Island, S. Pacific.	CLIV	Discharged, 25 April, 1921.
E.T.D.	,, ...	N.S.W.	Teamster	32	10 Nov., ,,	Bellingen, N.S.W.	CLV	Discharged 1 Dec., 1925.
T.F.	,, ...	Ireland	Civil servant	57	20 Dec., ,,	Hobart, Tas.	CLVI	Discharged, 18 June, 1921.
A.W.	Female	Sweden	Seamstress	62	18 Feb., 1921	Newcastle	CLVII	
D.A	Male...	N.S.W.	Teamster	71	26 May, ,,	Newcastle	XC	Died, 16 July, 1921.
J.C.	,,	N.S.W.	Fisherman	22	18 Aug., ,,	Tilba Tilba	CLVIII	
A.S.	Female	Queensland	Domestic	20	19 Jan., 1922	Redfern	CLIX	Returned to Peel Island, Queensland, 20 March, 1922.
Y.M.B.	Male ...	France	Labourer	67	7 June, ,,	Hunter's Hill	CLX	Died, 12 August, 1922.

* Native of New South Wales, of European descent. † Of European descent. ‡ Omitted in error from Annual Report for 1919.

Return showing particulars of Lepers detained at Little Bay, New South Wales, since the year 1883—*continued.*

Name.	Sex.	Native of—	Occupation.	Admission.		Where from.	No. of Case in Clinical Notes.	Died or Discharged.
				Age on.	Date of.			
E. ...	Male ...	Ceylon	Sailor	24	13 Dec. 1922.	Not fixed	CLXI	Repatriated, 26 June, 1923.
R.B. ...	,, ...	N.S.W.	Coach-painter	42	18 June, 1923.	Taree, N.S.W.	XCV	Died, 5 August, 1923.
C.E.B. ...	,, ...	Northern Terr.	Garage-proprietor	35	11 Aug. 1924.	Darwin, N.T.	CLXII	Discharged 16th Sept., 1925.
H.L.S. ...	,, ...	N.S.W.	Invalid-pensioner...	37	26 Oct., 1924.	Liverpool Asylum ..	CLXIII	
J.B.	,, ...	Ireland	Bush worker ...	61	28 Jan., 1925	Liverpool	CLXIV	
A.C.	,, ...	Germany	Importer	45	6 Mar., 1925	Sydney	CLXV	Absconded, 21 August, 1925.
K....... ...	,, ...	Hawaii	Musician	...	7 ,, 1925	,, ...	CLXVI	Repatriated, 11 March, 1925.
A.M. ...	,, ...	China............	School	12	12 ,, 1925. 1925.	,, ...	CLXVII	Repatriated, 16 December, 1925.
A.D.	,, ...	N.S.W.	,, ...	7	21 April, 1925. 1925.	,, ...	CLXVIII	Discharged, 1 December, 1925.
Wong Toe	,, ...	China............	Gardener	46	22 Nov., 1925.	Clarence River ...	CLXIX	
H.P.	,, ...	N.S.W.	Farmer	39	14 Dec., 1925.	Queensland	CLXX	Discharged, 9 Sep., 1926.
G.T.	,, ...	Scotland	Chemist..............	56	8 May, 1926.	Sydney.	....	Discharged, 21 July, 1926.

NOTES.—(*a*) The cases of a few other persons who, for one reason or other, were never admitted to the lazaret, have been mentioned in the course of this series of Reports, and are additional to those shown in this Table. (*b*) On comparison with the reports for early years, differences in ages or dates of admission of some coloured patients will be observed. Those now given are the correct ages and dates. Patients remaining under treatment have their initials shown in **black-faced type.**

Return showing admissions, discharges, &c., of Patients suffering from leprosy for the years 1916–1926.

		1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.
In Lazaret on 1st January		22	25	24	24	24	24	22	21	16	15	17
Admitted during the year		5	3	1	4	4	3	3	1	2	8	1
Died during the year		1	1	...	2	1	2	2	5	2	...	1
Discharged		1	3	1	2	3	1	2	...	1	4	2
Repatriated		...	...	...	...	...	2	...	1	...	2	...
Remaining in Lazaret on 31st December	Total	25	24	24	24	24	22	21	16	15	17	15
	Males	21	19	19	19	20	17	16	12	11	13	11
	Females ...	4	5	5	5	4	5	5	4	4	4	4

Birthplaces of Lepers.—The inmates of the Lazaret at the close of the year 1926 were of the following nationalities :—New South Wales, 5; Australian aboriginal, 1; Victoria, 1; England, 1; Ireland, 1; Sweden, 1; Pacific Islands, 2; China, 2; Greece, 1. Total, 15.

Working Expenses of Lazaret.—During the year 1926 the total cost of the management of this Institution was £3,368 12s. 2d. Calculated on the average number of inmates, the average cost per inmate per annum was £204 3s. 2d.

APPENDIX B.

I.—New Cases.

G.T., m., born 1870; admitted 8th May, 1926; discharged 21st July, 1926.

History.—States that from October, 1912, to May 1917, he was an attendant at the Queensland Leper Lazaret, Peel Island, and that in November, 1912, he accidentally cut his left hand with an axe.

In December, 1925, he noticed an altered area on the back of left hand, adjoining the scar of the above described injury.

On Admission.—He had a patch on the back of left hand, another on inner aspect of right wrist, and another on left elbow. These are partially anæsthetic. Ulnar nerves are not thickened.

B. Leprae were sought unsuccessfully in nasal mucus and in smears made from the patches.

Blood tested for Wassermann reaction gave a negative result.

II.—Readmissions.

Nil.

III.—Discharges.

Case CLXX.—m., born 1886; admitted 14th December, 1925; discharged 9th September, 1926.

Under treatment.

E.C.C.O. injection twice a week and Chaulmoogra Oil by mouth—he improved very much—the cutaneous swellings of the face and elsewhere subsided and the skin regained an almost normal appearance. B. Lepræ had been sought on many occasions with negative result. In fact B. Lepræ had never been found except in a piece of nerve excised before admission.

Under these circumstances the Board authorised his release on the usual parole.

IV.—Death.

Case XVII.—m.; born about 1862; admitted 14th August, 1886; died 8th September, 1926. He had been bed-ridden for nearly 2 years and probable cause of death was old age. His age could not be ascertained, but he looked to be more than 64. He had been 40 years in the Lazarette.

V.—Progress Report on other patients remaining on 31st December, 1926.

Case LXXXVII.—F.E.B., m., born 1876; admitted 25th November, 1903.

No notable leprotic changes during year. Increase of Ectropion due to facial paralysis. Body weight well maintained.

Case LXXXVIII.—G.M.S., f., born 1885; admitted 9th February, 1904.

Leprosy quiescent. General health good.

Case CI.—T.A., m., born 1870; admitted 11th July, 1905.

No fresh signs.

Case CXIII.—C.S.C., f., born 1867; admitted 16th April, 1907.

Leprosy has remained quiescent, but she has cancer of the breast with secondary deposits in cervical glands. Her weight has fallen from 9 st. 2 lb. in January to 6 st. 9 lb. in December.

Case CXVII.—A.R., f., born in 1901; admitted 14th January, 1908.

During the year she has gone down hill steadily. Her weight has fallen from 6 st. 3 lb. in January to 4st. 10lb. in December and she has often been so weak that she has had to stay in bed.

Case CXXIII.—L.C.M., born 1862; admitted 15th November, 1910.

During the year has developed numerous fresh nodules and has suffered much pain from these. Treatment—Besides taking Chaulmoogra Oil by mouth, he has had injections of E.C.C.O. Between 15th March, 1926, and 6th August, 1926, he had 39 intragluteal injections. The first 23 injections were 1 cc., the last 14 were 2 cc. At the end of the year he looked decidedly worse than in January.

Case CXXVIII.—S.C., m., born 1872; admitted 21st May, 1912.

Condition about the same.

Case CXXXVI.—A.C.P., m., born 1898; admitted 23rd June, 1914, discharged on parole 12th October, 1922, re-admitted 16th January, 1925.

No fresh signs developed.

On 10th June, 1926, a film made from skin over R. kneecap contained leprosy bacilli.

Case CXXXVII.—E.W., m., born 1864; admitted 17th November, 1914.

No fresh leprotic signs. Has had 2 influenzal attacks.

Case CXLIX.—P.P., m., born 1887; admitted 21st February, 1918.

Has become much disfigured by numerous nodules on face, trunk and limbs. Body weight remains same.

Case CLVII.—A.W., f., born 1859; admitted 18th February, 1921.

Has suffered much during the year. Fresh extensions of the nodular and of the nerve types of leprosy. At end of year weighed 120 lb.—a slight increase on last year's weight.

Case CLVIII.—J.C., m., born 1899; admitted 18th August, 1921.

Fresh outcrop of nodules, with pyrexia in March. Otherwise very well.

Case CLXIII.—H.L.S., m., born 1887; admitted 22nd October, 1924.

No fresh signs. General health good.

Case CLXIV.—J.B., m., born 1864; admitted 28th January, 1925.

In February and in August fresh crop of nodules with pyrexia. In June a painful swelling of R. shin resembling a gumma. Blood taken on 15th June, 1926 gave positive Wassermann reaction.

E.C.C.O. injection twice a week from April 13th to September 3rd. Dose 1cc. for 16 injections, 1·5 cc. for 2 injections, 2 cc. for 15 injections, and 3cc. for 8 injections. Has had also Pot. Iodid and Mercury and Digitalis.

Case CLXIX.—W.T., m., born 1879 admitted 22, November, 1925.

Has improved considerably during the year. Surface ulcerations have healed and there is now less disfigurement.

3.—DAVID BERRY HOSPITAL.

Berry, New South Wales.

REPORT of the Secretary for the year ending 31st December, 1926.

Administrative Staff.—Visiting Medical Officer, A. L. Stafford, M.B., Ch.M.; Secretary, H. Bruce; Matron, Miss D. G. Cawood.

Resident Staff.—Matron, 1 Sister, 1 Staff Nurse, 5 Pupil Nurses, Cook, Laundress, 1 Female Attendant and 3 Male Attendants.

Number of Wards and Beds.—Number of Wards, 6; Beds, 26 (22 beds, 4 cots).

General Cases.—Ward 1 (12,144 cubic feet), 10 beds, 1 cot; ward 2 (9,936 cubic feet), 8 beds, 1 cot; ward 3 (2,016 cubic feet), 1 bed; ward 4 (2,016 cubic feet), 1 bed.

Infectious Cases.—Ward 5 (2,160 cubic feet), 1 bed, 1 cot; ward 6 (2,160 cubic feet) 1 bed, 1 cot.

Sir,

I have the honour to submit herewith the annual report of this hospital for the year 1926.

Admissions and Discharges, 1926.—Remaining in on 1st January, 1926, 14; admitted during 1926 305; total, 319. Discharged, 289; deaths, 16; remaining in on 31st December, 1926, 14. Average daily number resident, 17. Total cost of maintenance £3891. Average cost per occupied bed, £229.

Figures show that the year the hospital has just passed through has been a successful one.

In-patients.—The total number of patients treated was 319, compared with 289 for the previous year; the average daily number resident was 17 as compared with 15·56 in 1925.

Out-patients.—The number of out patients who received relief was 75; 72 in 1925.

Anæsthetics.—The total number of operations performed was 188, (major 93, minor 95), and 66 visits were made by the Nowra doctors in connection with such operations: Dr. Foy, 23 visits; Dr. Ryan, 21 visits, and Drs. Rodway and Whitfield (Assistant) 22 visits.

Infectious Cases.—Thirteen infectious cases were admitted, viz., Scarlet fever, 4, Diphtheria, 5, and Mumps 4. Total 13.

Collections.—The collections for the year show a decided improvement, amounting to £510 11s. 2d. compared with £318 4s. 5d. for the previous year.

Buildings.—The buildings at the close of the year were in a good state of preservation, and very few repairs were found necessary during the twelve months.

Grounds.—In good order.

Staff.—The Institution is at present in charge of Dr. Stafford, visiting Medical Officer, and Miss Cawood, resident Matron, and the work has been carried out most harmoniously throughout the year.

H. BRUCE,
Secretary.

4.—MONTROSE MATERNITY HOSPITAL.

Lucas-road, Burwood.

REPORT FOR 1926.

Honorary Medical Officers.—A. L. Lance, M.B., Ch.M.; R. Walker, M.B., Ch.M.; G. C. Harper, M.B., and J. H. R. McCutcheon, M.B., Ch.M.

Matron.—Miss E. M. Copeman.

Staff Nurses.—Two (general nursing and obstetric certificates), and staff of certificated nurses undergoing obstetric training; 1 cook, 1 housemaid.

Nine nurses completed the obstetric course and successfully passed their Hospital and Registration examinations.

Number of Wards and Beds.—Ward A, 4,377 cubic feet, 4 beds, 4 cots; Ward C, 77,037 cubic feet, 8 beds, 8 cots. There have been 1, 543 admissions to "Montrose" since it was opened as a maternity hospital in 1920.

Admissions and Discharges.—Remaining in hospital 31st December, 1925, 11; admitted during 1926, 241; discharges, 243; died 3 adults (and 3 infants); remaining in hospital on 31st December, 1926, 6. Average daily number resident, 7. Annual cost of maintenance, £1,668. Average cost per bed, £238 5s. 9d.

Fifty-one beds were arranged for by expectant mothers who did not come in for confinement, nor send any word as to why they did not do so.

I regret to report that there were three adult deaths during the year. Two were cases of placenta previa, and the other a case of albuminuria and prolonged labour. These patients were all admitted as urgent cases after having been treated for 24 hours or longer in their own homes; none of them had arranged to come to "Montrose" for confinement.

Honorary Medical Staff.—Many thanks are due to the honorary medical officers who at all times are most willing to attend patients.

Repairs and improvements included painting the exterior of the building; also the hall, and Ward C. Two electric fans have been installed in this Ward, but notwithstanding this the temperature is at times very high.

E. M. COPEMAN,
Matron.

5.—FERNLEIGH PRE- AND POST-MATERNITY REST HOME.

Victoria-street, Ashfield.

Honorary Medical Staff.—G. L. Lance, M.B., Ch.M.; J. H. R. McCutcheon, M.B., Ch.M.; G. R. Walker, M.B., Ch.M.; G. C. Harper, M.B.

Resident Staff.—Matron, Miss L. D. Meares; Head Nurse, Miss Alcock.

Number of Beds and Wards.—Ward A, 6,543 cubic feet, 6 beds, 6 cots; Ward B, 6,480 cubic feet, 7 beds, 3 cots; Ward C, 4,104 cubic feet, 4 beds; total 17 beds, 9 cots.

Annual Return of Admissions and Discharges.—Remaining in on 31st December, 1925, 7 mothers, 4 babies; admitted during 1926, 210 mothers, 110 babies; discharged, 212 mothers 110 babies; remaining in on December 31st, 1926, 5 mothers, 4 babies. Daily average number resident, 9.

Annual cost of maintenance £1,408; average cost per occupied bed, £156 8s. 11d.

Sincere thanks are due to the medical staff, whose services are always readily available when required.

Sufficient vegetables and eggs are produced for use in the Home, any surplus being sent to Montrose Maternity Hospital.

L. D. MEARES,
Matron.

LADY EDELINE HOSPITAL FOR BABIES.

Greycliffe, Vaucluse.

ANNUAL REPORT FOR YEAR ENDED 31st DECEMBER, 1926.

Visiting Medical Officer, Dr. L. R. PARKER.

Honorary Staff of Consultants.—Sir Charles Clubbe, Consulting Surgeon; Dr. T. Storie Dixson, Consulting Physician; Dr. R. Norman Paul, Consulting Dermatologist; Dr. Cyril Shepherd, Consulting Ophthalmic Surgeon; Dr. R. S. Godsell, Consulting Ear, Nose, and Throat Surgeon.

Nursing Staff.—Matron, Miss H. J. Turner; two Staff Nurses and ten Pupil Nurses.

Number of Wards and Beds.—Ward 1 (4,330 cubic feet), 12 cots; Ward 2 (5,000 cubic feet), 15 cots; Ward 3 (4,000 cubic feet), 4 cots and 4 beds; Flowers Ward (1,500 cubic feet), 5 cots; Isolation Ward (2,500 cubic feet), 5 cots and 1 bed. Total—5 Wards; 41 cots, 5 beds.

Return of Admissions and Discharges.—Remaining in hospital on January 1st, 1926, 29 babies and 10 mothers. Admitted during the year, 169 babies. Discharged, 148; died 20; total number treated, 198. Remaining in hospital 31st December, 1926, 30. Daily average of cots occupied, 28. Average length of stay in hospital, 8 weeks. Mothers accommodated within the hospital, 44; 157 mothers attended as outpatients and received advice and treatment for their babies. Annual cost of maintenance and treatment £2,833. Average cost per occupied bed, £101 3s. 7d.

VISITING MEDICAL OFFICER'S REPORT.

The admissions to "Greycliffe" this year totalled 169 and out of this number 20 children died. Eight of these fatal cases occurred in the months of March and November, at which times severe epidemic conditions manifested themselves in other infant hospitals. Although a large number of children who contract these severe epidemic illnesses recover after unremitting attention and care, there is always a percentage in whom the toxic processes march irresistibly onward, and no method of attack or defence is successful.

MATRON'S REPORT.

Nature of Illnesses and Result of Treatment.—Acute gastro-enteritis, 42 cases (12 deaths); enteritis, malnutritional, 52 (3 deaths); marasmus, 66 (2 deaths); colitis, 10 (1 death); broncho-pneumonia, 12 (1 death); prematurity, enteritis, 3 (1 death); eczema 2; otitis media, 4; pyloric stenosis, 3; cerebral meningitis, 2; general peritonitis, 2; total cases treated, 198; deaths, 20.

Four cases of measles developed soon after admission and were transferred to the Coast Hospital; one of the mothers also developed measles and was removed to the Coast Hospital. A pupil nurse contracted scarlet fever outside the hospital; there were no further cases.

The table below shows the ages on admission of all babies treated during 1926; number of deaths, and duration of stay in hospital of fatal cases.

	3 months.	3—6 months.	6—9 months.	12 months and over.	Total.
	59	53	53	33	198
Died	8	9	2	1	20
Duration of stay in hospital of fatal cases	3 days ...2	36 hours ...1	5 days ...1	5 days ...1	
	4 ,, ...1	3 days ...1	11 ,, ...1		
	9 ,, ...1	4 ,, ...1			
	18 ,, ...1	9 ,, ...2			
	21 ,, ...1	17 ,, ...1			
	30 ,, ...2	19 ,, ...1			
		30 ,, ...2			
	8	9	2	1	

The milk supply as usual has been very satisfactory. The special cows at "Carrara" Convalescent Hospital yield sufficient milk to supply the babies at this hospital with an average of one quart per day.

Whey made from this fresh milk forms the basis of our sick babies' food; this is added to as the child's condition improves and digestion is restored.

The Sewing Guild conducted by a Committee of local ladies helps to keep our stocks of garments up to the desired standard. Materials are supplied by the hospital and all the little garments fashioned. The Guild meets twice a week for sewing. This is organised by Mrs. Cameron, who maintains a very great interest in the work.

The Sun Toy Fund supplied at Xmas a very useful collection of toys and a large sun umbrella for the garden, which is very useful for the babies' sun baths.

H. TURNER,
Matron.

7.—STRICKLAND CONVALESCENT HOSPITAL FOR WOMEN, CARRARA, ROSE BAY.

Report of the Matron for the year ended 31st December, 1926.

Visiting Medical Officer.—Dr. L. R. Parker.

Resident Staff.—Matron, Miss S. G. Hartley; 1 Senior and 1 Junior Nurse.

Number of Wards and Beds.—No. of wards, 9; No. of beds, 32.

Ward A, 4,038 cubic feet; Ward B, 8,557 cubic feet; Ward C, 4,038 cubic feet; Ward D, 3,477 cubic feet; Ward E, 3,477 cubic feet; Ward F, 7,334 cubic feet; Ward G, 3,477 cubic feet; Ward H, 1,736 cubic feet; Ward I, 2,232 cubic feet.

This hospital is utilised for women convalescent after severe illnesses.

Annual Return of Admissions and Discharges.—Number of patients remaining in on 1st January, 1926, 29; admitted during 1926, 620. Total number treated during 1926, 649; discharged, 625. Remaining in residence at 31st December, 1926, 24. Average daily number of beds occupied, 32. Annual cost of maintenance, £2,640; average annual cost per bed, £82 10s. From the date of its establishment in 1915 to the end of 1926, there have been 6,304 convalescents in residence.

The year has been satisfactory, and although many renovations have been completed the daily average was only slightly affected.

Portion of the grounds is utilised for a dairy herd, the milk from which supplies the infants at the Lady Edeline Hospital for Babies and the greater part of the milk used at "Carrara."

S. G. HARTLEY,
Matron.

8.—DENISTONE HOUSE CONVALESCENT HOSPITAL FOR MEN, EASTWOOD.

Annual Report for the Year ended 31st December, 1926.

Visiting Medical Officer.—Dr. D. Guthrie Hunter.

Resident Staff.—Matron, Miss I. M. Shiell; Nurse, 1; Attendant, 1.

Number of rooms used as wards, 7; indoor beds, 29.

Annual Return of Admissions and Discharges.—Patients in hospital, 31st December, 1925, 18; admitted during 1926, 290; discharged, 288; remaining in hospital, 31st December, 1926, 20; total number under treatment during the year, 307; daily average number resident, 21·36; annual cost of maintenance and treatment, £2,293; average cost per bed, £107 7s.

Denistone House is 387 feet above sea-level and is particularly suited as a convalescent hospital; patients derive great benefit from their stay, and improve rapidly in health. Since the opening of the institution in 1915 there have been 3,588 admissions.

Sufficient milk, eggs, fruit and vegetables are produced for hospital requirements, the output in 1926 being 3,142 gallons of milk, 2 cwt. of fruit, 780 dozen eggs, and 6 tons of vegetables.

M. RUSSELL HALL,
Acting Matron.

9.—WATERFALL SANATORIUM.

Report of the Medical Superintendent for the year ended 31st December, 1926.

Honorary Staff.

Honorary Consulting Physician, Dr. S. H. MacCulloch ; Honorary Physician, Dr. Cecil Purser.

Resident Administrative Staff.

Medical Superintendent, Dr. H. W. Palmer ; Senior Medical Officer, Dr. Kynaston Denham, D.S.O., Junior Medical Officer, Dr. J. M. Rainbow ; Manager, Mr. R. C. Rowe ; Matron, Miss K. Walsh ; Clerk and Storekeeper, Mr. A. Douglass.

Constitution of Hospital Staff on 31st December, 1926.

Medical and Administration : Medical Superintendent, Senior Medical Officer, Junior Medical Officer, Manager, Matron, Clerk. *Nursing* : Sub-matron, 4 Sisters, 27 Nurses. *General* ; 1 Foreman, 3 Artisans, 1 Motor Driver, 4 Male Cooks, 14 Attendants, 1 Female Cook, 2 Servants.

Number of Wards and Beds.

No. of Ward.	Capacity in cubic feet.	No. of Beds and Cots.	Cubic feet to each Bed.	No. of Extra Beds in Open Air.	No. of Ward.	Capacity in cubic feet.	No. of Beds and Cots.	Cubic feet to each Bed.	No. of Extra Beds in Open Air.
1	28,800	28	1,028	3	10	Open ward	...	....	11
2	28,800	28	1,028	4	A	28,800	28	1,028	......
3	28,800	28	1,028	4	B	28,800	28	1,028	12
4	28,800	28	1,028	4	C	28,800	28	1,028	......
5	21,600	18	1,200	3	D	28,000	28	1,028	......
6	21,600	18	1,200	7	Chalets	....	....	....	20
7	28,800	28	1,028	4					
8	28,800	28	1,028	3					
9	Open ward	...	....	26		Total ...	316	....	101

Total number of beds for male patients—In wards, 273 ; in chalets, 20 ; total, 293. Female patients—In wards, 124. Total beds for male and female patients—In wards, 397 ; chalets, 20 ; total, 417.

Admission and Discharge of Patients for 1926.

Number of patients remaining in on 1st January, 1926, 437 ; admitted during 1926, 518 ; total number under treatment, 985 ; discharged ("arrested" cases, 53 ; "much improved" cases, 69 ; "improved," 212 ; "unimproved," 32) 366 ; died, 187 ; remaining in residence at 31st December, 1926, 432 ; average daily number of occupied beds, 406 ; total cost of maintenance, £39 ,983 17s. 7d. ; average annual cost per inmate, £98 18s. 8d.

Condition on discharge and average residence in days of the 366 discharged patients—average residence of all discharged cases, 243 days.

	No. of Patients.	Average Residence.
		Days.
Disease arrested	53	475
Much improved	69	218
Improved	212	138
Unimproved	32	139
Total	366	243

Condition of Patients on admission and discharge during 1926.

Condition on Admission.	Arrested.	Much Improved.	Improved.	Unimproved.	Died.	Total.
Incipient	18	13	51	5	19	106
Moderately Early	23	45	105	15	60	248
Moderately Advanced	11	9	52	10	93	175
Far Advanced	1	2	4	2	15	24

* *Arrested Cases.*—Have no sign of active disease, temperature normal, no sputum, and able to do a fair amount of work.
† *Much Improved.*—Have slight signs of active disease, temperature normal, with or without sputum, fit for light work.
‡ *Improved.*—Disease more or less active, with various degrees of improvement.
§ *Unimproved.*—Disease progressing or no apparent improvement.

SUMMARY of Yearly Results of Admissions and Discharges for ten years, 1917 to 1926.

Year.	Total Patients under Treatment.		Total Discharges.				Deaths.
	In Residence beginning of year.	Admitted during year.	Arrested.	Much Improved.	Improved.	Unimproved.	
1917 ...	339	465	94	92	104	47	159
1918 ...	308	493	57	67	128	26	173
1919 ...	349	439	59	77	102	17	177
1920 ...	356	480	77	80	112	41	150
1921 ...	376	556	59	107	147	67	190
1922 ...	362	548	63	111	102	114	164
1923 ...	356	569	42	78	159	83	167
1924 ...	396	598	43	70	203	90	192
1925 ...	396	587	47	115	195	31	158
1926 ...	437	548	53	69	212	32	187

I have to report that during the year 1926 there were 985 patients under treatment, namely 631 males and 354 females. At the beginning of 1926 there were 294 male and 143 female patients in residence, and during the year 337 males and 211 females were admitted; 218 males and 148 females were discharged, and 115 male and 72 female patients died.

There remained in residence on 31st December, 1926, 432 patients (298 males and 134 females).

Of the 366 discharged patients, 53 were arrested cases having no signs of active disease; 69 were much improved and able to return to ordinary light work; 212 were somewhat improved, while 32 were not benefited by their stay at Waterfall.

Treatment was mainly along ordinary sanatorium lines, though tuberculins and antigens were used in a few suitable cases; "Newell's Treatment" was tested with negative results. Insolation treatment and heliotherapy were used in certain cases, but patients receiving such treatment must be protected against too severe action of the sun's rays.

The results for 1926 compare favourably with those of previous years, in view of the type of cases admitted to Waterfall and the number of incurable cases carried over from year to year.

The past year has seen little advance in the methods for control of tuberculosis, and the need for special efforts to counteract the ravages of this disease is urgent. At the instance of the Minister for Health a conference was held in June of representatives of all the organisations dealing with the prevention or treatment of tuberculosis. A scheme was adopted by the conference whereby each existing anti-tuberculosis agency would work in co-ordination with other such agencies, though still retaining its own individuality. This scheme provided for appointment of a Director of Tuberculosis to organise and carry on the work. For the scheme to be a success it is important that the Director of Tuberculosis should be provided with every assistance and that sufficient funds should be made available for carrying out necessary improvements in existing institutions, and for provision of a hospital near Sydney for advanced cases of tuberculosis.

Committee of Inquiry.—A Parliamentary Committee of Inquiry investigated the conditions under which work was carried on at Waterfall, and unanimously recommended that all the additions and improvements which had been pressed for during the last few years should be provided without delay, and the Sanatorium brought up to date. There is urgent need for immediate and full consideration to be given to the Committee's recommendations, and for the necessary improvements to be put in hand without delay.

X-ray Plant.—Proper up-to-date treatment of tuberculosis cannot be carried out without the aid of a suitable X-ray plant and artificial light apparatus, and these plants should be installed immediately.

New Buildings and Improvements.—Buildings and improvements carried out by the Works Department during the year consisted of a large laundry, which is to be fitted with up-to-date machinery, and should be in commission at an early date; and the complete installation of a new hot-water service. A large open-air dormitory for inmates has been completed by staff labour, while a second open-air ward is being erected for boys. The southern ends of the verandahs in the women's division are being enclosed with glass, while two other small open-air shelters have been erected, and a large portion of the hospital buildings painted.

Recreation and Amusements.—Outdoor amusements for the patients were provided by the opening of the bowling green and the croquet lawn. We have to thank the Hon. R. B. Orchard and other friends for the donation of a sufficiency of bowls; also Mrs. John Fuller for the presentation of a full-sized billiard table for the use of the women patients. Thanks are also due to the Sun Newspaper and the many subscribers who provided the wireless installation.

Vegetable Plots for Patients.—As in the previous year, a number of patients sufficiently recovered, were given a garden plot, and all vegetables grown by them were purchased by the Sanatorium at market rates. Although the season was not favourable, most of these patients had good returns, while all improved in bodily health.

Visiting Dentist.—The dental requirements of the patients have been carried out by Mr. Pye, who has visited the Sanatorium every fortnight for a full day, with great benefit to the patients concerned.

Introduction of 44-hour working week.—During the early half of the year considerable inconvenience and difficulties were experienced by the introduction of the 44-hour week, until an increase of staff was granted for the shorter working week. Extra staff is still urgently needed, if the Parliamentary Committee's recommendations are to be given effect to.

Increase in Medical Staff.—In November Dr. Rainbow was appointed as Junior Medical Officer, an appointment long overdue, as a third medical officer is essential for patients to be properly treated.

The appointment of a Director of Tuberculosis, and the recognition and likelihood of correction of the difficulties which have hampered the work at Waterfall for so long should make for a distinct advance in the control of tuberculosis throughout the State.

H. W. PALMER,
Medical Superintendent.

10.—ROOKWOOD STATE HOSPITAL AND ASYLUM FOR MEN.

Report of the Medical Superintendent for the year ended 31st December, 1926.

Honorary Visiting Staff.

Honorary Staff Surgeon, Dr. H. C. Rutherford Darling, M.D., M.S., F.R.C.S.; Honorary Assistant Surgeons, Dr. J. A. Lawson, M.B., Ch.M.; Honorary Ear, Throat, and Nose Surgeon, W. A. Dunn, M.R.C.S., Eng.; Honorary Ophthalmic Surgeons, Faleoner J. Blaxland, M.D.; G. A. Brookes, M.D., B.Sc.; A. L. North, M.B., Ch.M.; Honorary Neurologist, Andrew Davidson, M.D.; Honorary Dermatologist, A. Chapman M.B., Ch.M.

Administrative Staff.

Medical Superintendent, R. A. Fox, M.B., Ch.M.; Senior Medical Officer, Dr. E. J. Brooks, M.B., Ch.M.; Junior Medical Officer, Dr. J. F. Boag, M.B., Ch. M.; Manager, R. J. Brown; Dispenser, W. Lunney; Matron, Miss E. M. E. Manee; Sub-matron, Miss V. Angns; Clerk, A. T. Lord; Assistant Clerk, F. L. Carroll.

Constitution of Hospital Staff on 31st December, 1926.

Medical Superintendent, two Resident Medical Officers, Dispenser, Manager, two Clerks, Matron, Sub-matron, twenty-six Nurses, Chief Attendant, Chief Night Attendant, forty-one Attendants, Ambulance Driver, Storekeeper, Assistant Storekeeper, two Engineers, Foreman, two Carpenters, Plumber, Herdsman, two Out-door Attendants, three Cooks, Gardener.

Number of Wards and Beds.

Hospital Division.		General Division.		Total Accommodation.	Number of Beds.
Ward No.	Number of Beds.	Dormitories.	Number of Beds.		
				Hospital Division—	
2	83	5	68	Wards A-I	412
3	63	6	71	,, 2, 3, and 4	191
4	45	7	76	,, Chest Division.........	54
A	50	8	70	,, EP	90
B	50	9	70		
C	50	10	68		747
D	50	20	92		
E	28	21	93	*General Division—*	
F	52	Outside Locations.	42	Dormitories, 5-10	423
G	50			,, 20 and 21	185
H	37			,, Outside locations	42
I	45				
Chest.	54				650
EP.	90				
14	747	8	650	Total	*1,397

* This total does not include 176 stretcher beds (Hospital Division, 93; General, 83) installed to meet urgent demands for additional accommodation.

Admissions and Discharges.

Remaining in on 1st January, 1926, 1,414; admitted during 1926, 3,644; discharged, 2,189; died, 614; remaining in on 31st December, 1926, 1,411; Hospital Division, 837; dormitories, 574.

Average daily number of persons resident, 1923, 1,487; 1924, 1,485; 1925, 1,485; 1926, 1,457

Total cost of maintenance and treatment of patients and inmates for 1926, £83,381. Average annual cost of patients and inmates, £57 4s. 6½d.

Work of Honorary Medical Officers.

The Department is under a deep debt of gratitude to those Medical Officers who have attended the Institution throughout the year in an honorary capacity and rendered much valuable assistance in the treatment of patients.

Dr. W. A. Ramsay Sharp, Honorary Surgeon, tendered his resignation in May, 1926, and in December, 1926, Dr. H. C. Rutherford Darling was appointed Honorary Surgeon in his place, with Dr. J. A. Lawson as Honorary Assistant Surgeon.

Dr. A. Chapman was in the same month appointed Honorary Dermatologist, an appointment which should prove of much value to the Institution's work in that section in the future.

During the year Dr. A. L. North was appointed Assistant Honorary Ophthalmic Surgeon for the period of Dr. Blaxland's absence from the State.

The following operations were carried out during the year:—Dr. Ramsay Sharp, 7; Eye operations—Dr. Blaxland, 19; Dr. G. A. Brookes, 56; Dr. Dunn, Ear and Throat, 3.

Apart from and in addition to the foregoing, and mainly in the period between the resignation of Dr. Ramsay Sharp and the end of the year, 162 operations (major and minor) were performed by the Resident Medical Staff. Dr. Murray, of the Coast Hospital staff, assisted on a few occasions when called upon.

Massage Department.—During the year 363 patients were given treatment, with the following results:—Recovered, 178; relieved, 118; unrelieved, 25; under treatment at end of year, 42—363. Of the total number treated, 98 took discharge on recovery.

Recreation for the Inmates. The cinema installed a few years ago has been the means of providing regular amusement. The apparatus is the property of the Institution, and by the generosity of the Universal Film Manufacturing Co. (Australasia) Ltd., in providing programmes free of cost, an entertainment has been given once a week throughout the year.

In addition to the above, first-rate concerts and other entertainments have been provided almost every Saturday night throughout the year. The management and inmates are grateful to the many kind friends who have come, often at much inconvenience to themselves, to provide these entertainments.

Special thanks are due to the "Smith" Family for their annual distribution of Xmas cheer, and for special gifts of gramophones for use in the wards.

The wireless installation at the Chest Ward provided by the Auburn Returned Soldiers' and Sailors' League has been a source of great pleasure to the patients in that Division during the past year, and the new billiard room and recreation room erected by the Staff of this Institution, and officially opened by the Honorable George Cann, Minister for Public Health, just before Xmas, 1926, is proving a boon to the patients in the Chest Ward.

The bowling green at the Chest Ward is largely availed of by the patients there, and is much appreciated.

Diet.—In addition to providing diet in accordance with the approved scale, the medical lists have been sufficiently liberal to include the full requirements of all who were unable to partake of the scale allowance.

Accommodation.—The accommodation in all sections of the Institution has been taxed to the utmost throughout the year. The hospital wards in particular have been constantly overcrowded, many beds having to be temporarily improvised on the floors and on verandahs.

The standard number of beds in all hospital wards is 745, whereas the number provided for has at times exceeded 900—the excess being sufficient to nominally fill three of our average wards.

This elasticity in temporary provision of beds has now practically reached its limit, and additional buildings are urgently needed if the ever-increasing influx of patients is permitted to continue.

OUT-DOOR SECTION.

Farm and Dairy.—An area of approximately 50 acres is constantly under cultivation for the purpose of providing green fodder for the dairy herd. During the year 156 tons of various green crops were provided.

The cows yielded 60,908 gallons of milk, which fully met the requirements of the Institution.

In the dairy herd the Friesian class predominates, the quality of these animals being demonstrated by the number of prizes and awards secured by them at the Royal Agricultural Society's Show for some years past. Continued efforts are being made to build up the standard of milk production, and the results from the young stock passed into the milking stage have been most gratifying. The health of the herd continues good, the result of the latest tuberculin test being 100 per cent. sound.

In October the forage sheds at the dairy were unfortunately destroyed by fire, and up to the end of the year the work of rebuilding had not commenced. The want of shelter is causing excessive deterioration in the quality of the feed, and much discomfort to the men handling the feed, as both feed and men are exposed to all weathers.

Vegetable Garden.—The excessively dry season, combined with labour shortage, operated detrimentally to the vegetable production, only 106,668 lb were raised as compared with 164,191 lb. in 1925. The appointment of a skilled vegetable gardener to give full time to this work has been asked for, and such an appointment is required to enable the maximum of results to be obtained.

Piggery.—The bulk of the pig stock has been transferred to the new piggery, but a considerable amount of work still requires to be done in fencing off separate runs for the various classes. Within the past few months some thirty young brood sows have been transferred from Liverpool and Newington for the purpose of improving the standard, and better results are expected in the coming year under the improved conditions.

R. J. BROWN,
Manager.

R. A. FOX,
Medical Superintendent.

11.—LIVERPOOL STATE HOSPITAL AND ASYLUM FOR MEN.

Report of Medical Superintendent for year ended 31st December, 1926.

Honorary Visiting Staff.—Honorary Ear, Nose and Throat Surgeon, Richard Arthur, M.B., M.L.A., Honorary Dermatologist, W. A. McDonald, B.A., M.B., Ch.M.; Honorary Medical Officer, J. Pirie, L.R.C.P., L.R.C.S., Edin., L.R.C.P.S., Glas.

Staff.—Medical Superintendent, Donald Wallace, M.A., M.B., Ch.M.; Junior Medical Officer, R. W. Thompson, M.B., Ch.M.; Manager, (Acting); J. J. Ranshaw; Dispenser, A. J. Baker; Matron, L. W. MacIntosh; Clerk, E. G. Partridge; Nurses, 11; Attendants, 21; other male staff, 10.

Constitution of Hospital Staff on 31st December, 1926.—Medical Superintendent, Junior Medical Officer, Manager, Matron, Submatron, 10 Nurses, Clerk, Storekeeper, Dispenser, Engineer, Foreman, Carpenter, Plumber, Painter, Gardener, Chief Attendant, 20 Attendants, Baker, and 2 Cooks.

Number of Wards and Beds.

Hospital Division.		General Division.		Total Accommodation.	No. of Beds.
Ward No.	No. of Beds.	Dormitories.	No. of Beds.		
A	30	1	10		
B	29	2	21		
C	25	3	25		
D	30	4	43	Hospital Division	299
E	30	5	43		
F	30	6	26		
G	28	7	42		
K	10	8	22		
L	10	9	34		
M	22	10	6	General Division	424
N	17	11	50		
R	21	12	52		
S	17	13	52		
Total—13	299	13	424	Total	723*

* This total does not include 19 inmate workers' beds located in outbuildings.

Admissions and Discharges for Year ended 31st December, 1926.

Number of persons in residence on 1st January, 1926, 654; admitted, 2,363; total, 3,017; discharged, 2,158; died, 182; in residence on 31st December, 1926, 677. Total cost of maintenance and treatment, £37,938 11s. 7d. Average annual cost per inmate, £55 1s. 3d.

Summary of Patients treated in the various Wards during 1926.

Hospital Section.	In Hospital, 1st January, 1926.	Admitted during year.	Discharged during year.	Died during year.	In Hospital, 31st December, 1926.
Cancer Wards	32	97	32	60	37
Venereal ,,	37	418	412	1	42
General ,,	190	663	569	104	180
Totals	259	1,178	1,013	165	259
District Ward	19	162	144	17	20
Grand Total	278	1,340	1,157	182	279

Out Patients.—The number of district patients seeking relief in the out-door department shows a definite increase—430—on last year's figures. There were recorded 4,857 attendances, including 2,246 dressings and operations in the district ward. Dr. Pirie, the Hon. Medical Officer, has continued to render valuable service to this department.

Venereal Wards.—The demand for accommodation in these wards was fully maintained. The provisions of the Venereal Diseases Act have been carefully carried out.

Dr. McDonald, Honorary Dermatologist, paid regular visits at intervals of two weeks, thus giving very valuable assistance in the venereal clinic.

Inmate Accommodation.—The number of inmates in July attained the grand total of 742, which exceeds by 61 the highest record of any previous year.

Accommodation for Nursing Staff.—The question of the erection of quarters for the matron and nursing staff in the old Moore College grounds is still in abeyance. It would be of considerable benefit to the hospital and to the members of the nursing staff, who are at present obliged to live away from the institution, if this work were proceeded with at an early date.

Lighting.—Electric light was installed throughout the institution towards the close of the year.

Farm and Dairy.—The need for green and uncooked vegetables and fresh unboiled milk as a corrective of the regulation institutional diet has been kept in view in directing the operations of the vegetable garden and dairy. Taking into consideration the unfavourable weather conditions, the quantities of these commodities produced during the year was satisfactory.

Urgent Improvements Required.

1. *District Ward*—The urgent need for supplying this ward with suitable lavatory accommodation bathrooms, &c., is again strongly emphasised.

2. *Hospital Wards.*—The general hospital accommodation was again severely taxed. All the wards are very poorly equipped; a hot and cold water service throughout is especially a much-needed improvement. Even cold water has to be carried from without, and there are no adequate means for cleansing the hands when attending to patients. As want of this supply intimately involves the comfort, and even the health of the attendants and patients, it cannot be over-emphasised.

3. *Cancer Wards.*—The provision of laundry premises with steam equipment for these wards is still an urgent necessity.

D. WALLACE,
Medical Superintendent.

Manager's Review of the Out-door Work for the year ended 31*st December,* 1926.

Satisfactory progress was made with the Out-door Work, although the continued shortage of inmate workers somewhat militated against more rapid development of the farming section.

Dairy Farm.—The quantity of milk produced was 16,548 gallons, valued at £1,170. The herdsman's cottage is now almost ready for occupation, and it is anticipated that with the appointment of a herdsman in the near future this section will be placed on a thoroughly satisfactory basis.

Piggery.—This section gave very satisfactory results during the year, the sales amounting to £942, and pork to the value of £45 was used.

Farm, Vegetable Garden, and Orchard.—Green feed to the value of £91 was grown on the farm, thus considerably reducing the cost of fodder. 59,110 lbs. of vegetables were grown, valued at £531; the yield of fruit was 4,988 lbs., valued at £108.

Bakery.—The usual high standard of quality was maintained. The total bread production was 231,068 lbs.; buns, 176 dozen; cake, 5,760 lbs.; total production based on contract supplies to other similar institutions, amounted to £1,839 15s. 11d., a net saving of £285 18s. 6d.

Condition of Buildings.—All institution buildings were maintained in a reasonable state of efficiency. A staff painter was appointed about the middle of the year, and the painting of the institution throughout is being proceeded with as rapidly as possible.

Garden and Grounds.—The condition of the gardens and grounds has been well maintained, and the work of laying out roads and ornamental garden in the new dormitory section has proceeded satisfactorily.

Septic Tanks.—Additions were completed towards the end of the year and the capacity of the tanks and filter beds was increased considerably.

J. J. RANSHAW,
Manager.

12.—NEWINGTON STATE HOSPITAL AND ASYLUM.

Report for the year ended 31st December, 1926.

Honorary Visiting Staff.—Honorary Surgeon, Walter A. Sharpe, M.S., F.R.C.S., Edin.; Honorary Ophthalmic Surgeon, Cedric K. Cohen, M.B., M.S.; Honorary Ear, Throat, and Nose Surgeon, Herbert H. Johnston, M.D. Surg., Univ. Sydney; Honorary Neurologist, A. Davidson, M.D.

Visiting Medical Officer.—Francis H. Furnival, M.R.C.S., Eng., L.S.A., London.

Staff.—Medical Officer, Lottie Sharfstein, M.B.; Manager, William Megarvey; Matron, Miss Emily Wood; Clerk and Storekeeper, Charles G. Grove; Clerk, Edwin C. Curran; Dispenser, Miss K. M. Legg.

Constitution of Staff on 31*st December,* 1926.—Visiting Medical Officer, Medical Officer, Manager, Matron, Clerk, and Storekeeper, Clerk, Dispenser, 28 Nurses, Housekeeper, Seamstress, Cook, 2 Housemaids, Carpenter, Plumber, Herdsman, Gardener, Night Patrol, and Dentist who visits weekly.

Admissions and Discharges.—Number of inmates on 1st January, 1926, 659; number admitted during the year, 1,280; total, 1,939; discharged, 1,082; died, 184; remaining on 31st December, 1926, 673. Total cost of maintenance and treatment of patients for 1926, £30,761 10s. 1d. Average annual cost per inmate, £44 9s. Average daily population 692.

Number of Wards and Beds.—Hospital Division.—Wards: A, 43 beds; B, 42 beds; C, 10 beds; C2, 10 beds; D, 15 beds; E, 14 beds; F, 51 beds; G, 56 beds; H, 60 beds; H1, 4 beds; J1, 29 beds; J2, 27 beds; Isolation, 12 beds; Cottages, 49 beds.

Yard Division.—Dormitories: No. 1, 36 beds; No. 2, 39 beds; No. 3, 38 beds; No. 4, 39 beds; No. 5, 38 beds; No. 6, 38 beds; No. 7, 39 beds; No. 8, 39 beds.

Total beds.—728 (wards, 422; dormitories, 306).

Hospital Division Summary.—Patients in hospital 1st January, 1926, 307, admitted during the year, 878. Discharged, 685 (recovered, 274; relieved, 386; unrelieved, 25) died, 184.

Classification of Diseases treated.—General diseases, 200; alimentary system, 27; circulatory, 104; respiratory, 111; genito-urinary, 23; nervous system, 92; osseous and arthritis, 7; skin, glands, &c., 116; senility, 111; miscellaneous, 4; wounds, &c., 74.

GENERAL.

Staff Changes.—The medical staff has not changed during the year. Miss C. M. Dickson, Matron, was transferred to the Coast Hospital as Sub-Matron, and Miss Emily Wood was appointed Matron at this Institution.

Buildings, &c.—The buildings have in most cases been painted and repaired by local labour.

A dormitory to accommodate 25 working male inmates has been erected with reinforced concrete slabs, made by inmate labour with cement and cinders. The cost is only three-fourths that of wood or fibro-cement.

Other Improvements.—The Sydney Harbour Trust has, by arrangement with the department, dredged the river and filled in an area of about 15 acres of swamp land to a sufficient depth to make it drainable. By this work an eyesore and breeding ground for mosquitoes has been removed.

The Minister has granted an amount equal to three years rates on the Institution property towards the reconditioning of Sutherland-street, which is the only approach to the Institution, and at present in a very bad state.

Recreation and Amusements.—Ample entertainment has been provided for the inmates. Many concert parties have visited Newington, and dances are held during the winter months.

A fancy dress ball was promoted by the staff in June last, and much pleasure was derived by the inmates.

The " Smith Family " provided a band for the ball and were assisted by Mr. Fraser's band. They both helped to make the function a marked success.

On Mother's Day, Mrs. Heydon, of Leichhardt, presented each inmate with a small parcel containing useful articles.

The " Smith Family " gave out cakes and fruit at Christmas time, and presented books for the library.

The Australian Films, Ltd, provide the films and Messrs. Rowe and Williams, of Burwood, supply the apparatus for cinema entertainments each fortnight, which affords much pleasure to the inmates, who otherwise would have little chance of seeing moving pictures.

Farm and Dairy Operations.—Approximate value of vegetables produced £388. Milk, £3,662.

Revenue collections for the year amounted to £7,861, including sale of pigs, £756; cows, calves, &c., £81; tallow, £120.

W. MEGARVEY,
Manager.

13.—STATE ASYLUM FOR AGED AND INFIRM MEN, GEORGE-STREET, PARRAMATTA.

Report of the Officer-in-Charge for the year ended 31st December, 1926.

Staff.

Visiting Medical Officer—Dr. W. S. Brown.
Officer-in Charge, C. A. Warner. Attendants, 5.

Number of beds in hospital, 39 ; in dormitories, 301 ; total, 340.

Admissions and Discharges.—Remaining in on 31st December, 1925, 100; admitted during year, 1,746; discharged, 1,658; died, 9; remaining in on 31st December, 1926; 239; average daily population, 210; total cost of maintenance, 1926, £7,387 18s. 6d.; average annual cost per inmate, £32 5s. 1d.

Hospital Division.—Number in hospital on 31st December, 1925, 20; admitted during 1926, 69; discharged, 58; died, 9; remaining in hospital on 31st December, 1926, 22.

Number of visits by Visiting Medical Officer, 221. Inmates seen by Visiting Medical Officer, 2,220, of whom 220 were transferred to other institutions—14 to Liverpool State Hospital, and 206 to Rookwood State Hospital.

Workshops.—The following articles were made during the year :—46 aprons, 63 sheets, 143 pillow cases, 243 towels, 92 coats, 50 vests, 229 trousers.

Improvements and Repairs.—The ward ceilings and offices have been repainted, roofs of main buildings repaired and painted, and new guttering fixed, new water service laid on to bathroom, and a 9-in concrete floor put in coal bunkers.

Regular monthly visits were made by the senior attendant at midnight. The conduct and discharge of duties by the staff have been satisfactory.

C. A. WARNER,
Officer-in-Charge.

14.—STATE HOSPITAL AND ASYLUM FOR THE BLIND AND MEN OF DEFECTIVE SIGHT AND SENILITY, MACQUARIE-STREET, PARRAMATTA.

Staff.

Visiting Medical Officer	Dr. W. S. Brown.
Officer-in-Charge	Mr. H. A. Pyne.

Total Number of Beds.—228.

Admissions and Discharges.—Remaining in on 31st December, 1925, 174 ; admitted during 1926, 703, discharged 700 ; deaths, 4 ; remaining in on 31st December, 1926, 173. Daily average number resident, 175·5. Total cost of maintenance and treatment of inmates, £6,662 10s. 4d. ; average cost per inmate, £37 10s. 8d.

Dental Work is carried on at the Institution by a fully qualified dentist, who makes monthly visits.

Bakery.—Malt bread and currant cake made at the Institution, in 1926, totalled 1,004,236 lbs. of bread, 49,969 lbs. of currant cake, and 683 doz. buns. The whole of the output was distributed to Waterfall Sanatorium, and the State Hospitals and Asylums at Rookwood, Newington, George-street and Macquarie-street.

General.—Inmates' clothing, bedding, &c., with the exception of boots and hats, are made on the premises by inmates' labour. All carpentry work, repairs to buildings, painting, bricklaying, &c., are carried on under the supervision of the Officer-in-Charge.

During the year a new fumigator was built. This was a very necessary work as the old fumigator was unsatisfactory, and not large enough for requirements.

The Visiting Medical Officer attended on 257 occasions.

H. PYNE,
Officer-in-Charge.

15.—STATISTICAL SUMMARY.

Table I.—Summarised Statement of Expenditure:—Montrose Maternity Hospital, Fernleigh Rest Home, Lady Edeline Hospital for Babies and Carrara and Denistone Convalescent Homes, for the year ended 31st December, 1926.

Head of Expenditure.	Montrose Maternity Hospital.			Fernleigh Rest Home.			Lady Edeline Hospital for Babies.			Carrara Convalescent Hospital.			Denistone Convalescent Hospital.			Totals.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Salaries	913	0	0	782	0	0	1,274	0	0	952	0	0	849	0	0	4,770	0	0
Gratuities	41	0	0	19	0	0	167	0	0	155	0	0	248	0	0	630	0	0
Provisions	450	0	0	417	0	0	840	0	0	946	0	0	750	0	0	3,403	0	0
Insurance	4	0	0	3	0	0	6	0	0	4	0	0	5	0	0	22	0	0
Telephone	17	0	0	8	0	0	29	0	0	21	0	0	33	0	0	108	0	0
Stimulants	8	0	0	2	0	0	11	0	0	15	0	0	9	0	0	45	0	0
Drugs	35	0	0	12	0	0	62	0	0	35	0	0	26	0	0	170	0	0
Disinfectants	7	0	0	3	0	0	7	0	0	9	0	0	10	0	0	36	0	0
Fuel	87	0	0	57	0	0	174	0	0	126	0	0	69	0	0	513	0	0
Light	34	0	0	46	0	0	168	0	0	71	0	0	70	0	0	389	0	0
Hardware	9	0	0	5	0	0	12	0	0	17	0	0	10	0	0	53	0	0
Clothing, &c.	25	0	0	10	0	0	15	0	0	40	0	0	35	0	0	125	0	0
Cows and horses	....			....			....			....			....			....		
Travelling expenses, &c.	10	0	0	15	0	0	21	0	0	12	0	0	10	0	0	68	0	0
Repairs, &c.	13	0	0	7	0	0	29	0	0	50	0	0	25	0	0	124	0	0
Postage	5	0	0	4	0	0	8	0	0	6	0	0	5	0	0	28	0	0
Forage	....			....			....			160	0	0	124	0	0	284	0	0
Sundries	10	0	0	18	0	0	10	0	0	21	0	0	15	0	0	74	0	0
Total	1,668	0	0	1,408	0	0	2,833	0	0	2,640	0	0	2,293	0	0	10,842	0	0
Average daily number of patients	7			9			28			32			21·36			97·36		
Average cost per occupied bed £	238	5	9	156	8	11	101	3	7	82	10	0	107	7	0	111	7	2

STATISTICAL SUMMARY—(*Continued.*)

TABLE II.—SUMMARY STATEMENT of Expenditure, State Hospitals and Asylums for the Infirm, for the year ended 31st December, 1926.

Head of Expenditure.	Rookwood.	Liverpool.	Newington.	Waterfall Sanatorium.	Parramatta.		Total.
					George-street.	Macquarie-street.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Salaries, Wages, and Gratuities (including expenses of Administration)	28,727 11 6	17,748 11 1	12,142 7 7	14,756 13 3	2,283 1 9	1,934 0 6	77,592 5 8
Provisions	27,840 13 5	10,891 5 7	7,577 16 2	17,441 1 2	2,964 14 9	3,570 2 6	70,285 13 7
Alcohol	1,002 2 6	136 19 8	15 8 7	42 9 8	7 16 0	... .	1,204 16 5
Drugs and Surgical Appliances	3,828 15 9	816 15 1	947 7 8	546 15 4	271 16 6	216 6 0	6,627 16 4
Disinfectants	22 1 6	75 10 0	8 0 8	76 7 9	1 8 8	6 11 4	189 19 11
Fuel	3,123 11 0	506 0 1	2,233 13 2	1,235 14 10	243 11 4	196 2 4	7,538 12 9
Light	886 14 4	577 8 1	47 17 11	720 5 11	81 4 5	69 13 8	2,383 4 4
Water	1,123 19 0	201 0 10	636 8 10	730 9 9	5 15 6	21 11 8	2,719 5 7
Burials (including ground fees)	302 10 0	154 18 10	41 5 0	18 0 0	8 15 0	1 5 0	526 13 10
Hardware	2,771 6 1	354 1 5	523 15 1	354 13 5	70 13 3	98 12 1	4,173 1 4
Clothing, Linen, Blankets, &c.	6,385 12 1	3,114 18 7	2,362 15 10	2,184 10 3	685 1 4	607 11 3	15,340 9 4
Fodder purchased	4,259 19 3	1,739 8 10	3,123 13 2	403 12 1	61 16 6	....	9,588 9 10
Poultry	2 2 0	....	59 8 8	....	85 10 11	....	147 1 7
Horses and Cows, &c.	205 0 0	21 0 0	....	73 8 7	....	....	299 8 7
Furniture, Railway Expenses, &c.	665 13 11	927 13 3	1,017 6 2	922 1 1	165 9 8	35 8 6	3,733 12 7
Repairs and Maintenance of Buildings	308 19 11	1,011 8 5	228 3 0	320 0 7	163 5 5	56 12 8	2,088 10 0
Printing, Stationery, and Postage	255 17 0	66 18 9	49 12 8	87 18 6	24 9 9	12 4 11	497 1 7
Sundries	746 15 0	290 15 10	804 13 3	252 18 7	39 4 10	68 9 9	2,202 17 3
Total	82,459 4 3	38,634 14 4	31,819 13 5	40,167 0 9	7,163 15 7	6,894 12 2	207,139 0 6
Stock on hand 31st December, 1925	7,966 9 10	5,563 0 10	3,186 16 2	2,685 9 2	1,294 7 9	758 14 0	21,454 17 9
Adjustment of Exchange	594 15 0	704 19 7	1,981 11 10	....	224 2 11	279 8 3	3,784 17 7
Grand Total	91,020 9 1	44,902 14 9	36,988 1 5	42,852 9 11	8,682 6 3	7,932 14 5	232,378 15 10
Deduct—							
Proceeds of Sales	1,253 1 9	1,375 19 8	1,008 18 7	381 15 5	79 8 4	254 6 10	4,353 10 7
Stock on hand 31st December, 1926	6,273 11 4	5,485 15 6	2,743 2 2	2,386 16 11	1,214 19 5	832 5 2	19,036 10 6
Adjustment of Exchange	112 16 0	102 8 0	2,474 9 10	....	224 2 11	183 12 1	3,097 8 10
Total Deductions	7,639 9 1	6,964 3 2	6,226 10 7	2,868 12 4	1,518 10 8	1,270 4 1	26,487 9 11
Total Cost	83,381 0 0	37,938 11 7	30,761 10 10	39.983 17 7	7,163 15 7	6,662 10 4	205,891 5 11
Average daily population	1,457	689	692	406	210	175·5	....
Average annual cost per inmate £	57 4 6½	55 1 3	44 9 0	98 18 8	32 5 1	37 10 8	....
Annual contributions towards maintenance £	1,510 15 4	3,658 13 0	6,493 0 5	2,183 1 10	535 13 3	1,472 13 11	15,853 17 9

SECTION IV.

Seventeenth Report of the Microbiological Laboratory (Government Bureau of Microbiology) for the Year 1926.

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SECTION IV.

Seventeenth Report of the Microbiological Laboratory (Government Bureau of Microbiology) for the year 1926.

The Principal Microbiologist to The Director-General of Public Health.

Sir,

I have the honour to submit the accompanying report dealing with the work performed in the Microbiological Laboratory during 1926.

The progressive increase of work recorded in previous years has been more than maintained, 30,627 examinations having been made in 1926, as against 25,344 in 1925, an increase of nearly 20 per cent. The increased demand for bacteriological examinations and tests has been general, and extends practically throughout the whole of the sections, the greatest increase, as in the previous year, is in the serological work.

Plague.—No case of human plague occurred during 1926, nor were any infected animals found among the 8,711 rats and mice examined. Material from one suspected human case was investigated with negative results.

Diphtheria.—There was a substantial increase in the number of swabbings submitted, 4,129 being examined in 1926, and 2,848 in 1925. Examinations for toxicity (234) were practically the same as in 1925. The number of Schick tests performed was smaller (822 as against 1,056 in 1925) and was due to the staff being too occupied with other work to accede to a number of requests made for application of the test. It will be necessary to make special provision at an early date for undertaking this important section of preventive medicine.

Tuberculosis.—The number of specimens examined (3,044) for the presence of tubercle bacilli was greater than for any previous year by about 200; the highest number previously examined was 2,881 specimens in 1924.

Venereal Diseases.—Syphilis and Gonorrhœa. The serological tests in diagnosis and progress of treatment of these infections have greatly increased in numbers. In 1926, 11,611 tests were made on 6,035 specimens, compared with 8,831 tests on 5,186 specimens in 1925. In addition to these serological tests, 3,372 smears were examined for the presence of gonococci, an increase on the figures for 1925 (2,487) of over 35 per cent. The additional tests applied have caused so considerable an increase in work in connection with these diseases that it became necessary during the year to appoint an additional medical officer to cope with the examinations, which now occupy practically the whole time of two medical officers.

Typhoid Fever.—The number of examinations for detection of typhoid infection increased from 882 in 1925 to 986 in 1926. Two outbreaks of typhoid fever occurred at Goulburn Gaol, the periods covered being from 8th February, 1926, to 27th May, 1926, and from 18th December, 1926, to 1st February, 1927. The second epidemic extended over the first month of 1927, but for convenience it has been considered advisable to include a summary of both epidemics in this report (p. 146).

Anthrax.—Eleven specimens were examined for the presence of anthrax bacilli, of which eight were shaving brushes, and two material from human beings. No positive results were obtained from any of the specimens.

Biochemical Work.—619 specimens were examined in this section, compared with 434 in 1925. The majority of the specimens were from metropolitan and suburban hospitals in which no facilities existed for these elaborate tests. A considerable increase in the volume of work is indicated by the increased figures owing to the complicated technique and time involved in carrying out many of the tests. The extended use of the laboratory for this work is satisfactory, and should be encouraged; and it may be necessary in the near future to make further provision for the needs of this section.

Pathological Tissues.—The increase shown in previous years in the number of specimens submitted for histological examination has been maintained; 1,274 tissues were examined in 1926, compared with 1,141 in 1925. Malignant disease was diagnosed in 391 specimens.

Hygienic Examinations.—Water Samples.—The increase under this heading was largely due to examination of samples of water from the public supplies of various inland towns. This is a very important section which is likely to increase rapidly as settlement becomes denser. *Food materials.*—Fewer food samples were submitted for testing for bacterial contamination than in 1925. *Milk.*—Bacterial counts were made on 406 samples of milk from suburban dairies, and country and suburban milk distributing companies. *Air.*—77 samples of air collected under the direction of the Medical Officer for Industrial Hygiene were bacteriologically examined. These tests are being continued with a view to arriving at a standard of ventilation to be maintained in public halls and theatres.

Staff.—Dr. Marie M. Hamilton was appointed as Assistant Microbiologist on 3rd June, 1926, and her services are fully occupied with serological work.

Mr. F. C. Calf, Laboratory Attendant, entered on ten months extended leave on 1st September, 1926, prior to retirement. Mr. E. Kilminster was temporarily transferred from the Technical College to the attendant staff, and, subsequently, Mr. H. Moseley, who had been attached to the Chief Sanitary Inspector's staff for some years, was transferred to the laboratory attendant staff.

Death of Mr. E. Douthwaite.—Mr. Douthwaite died on 2nd December, after a short illness. He was appointed to the laboratory attendant staff on 3rd October, 1917, on his return from active service, where he had been seriously wounded. Although not capable of heavy work, Mr. Douthwaite carried out his duties of caring for the experimental animals in a willing and satisfactory manner.

Serious Illness of Dr. E. W. Ferguson.—At the end of November the Principal Microbiologist, Dr. E. W. Ferguson, became gravely ill, and was granted extended sick leave.

Need for Additional Staff, and for extension of accommodation.—The steady increase in work has not been accompanied by a commensurate increase in the staff, an assistant microbiologist being the only additional officer appointed. It is essential that other branches of the staff should be added to at an early date.

Accommodation.—A comprehensive survey of the congestion arising from want of proper accommodation was submitted on 31st August, 1926. It is again emphasised that no additional accommodation has been provided to relieve the congestion, which has become more intensified with the increase of work.

ERNEST L. MORGAN,
Acting Principal Microbiologist.

Staff.

Principal Microbiologist: EUSTACE WILLIAM FERGUSON, M.B., Ch.M., D.P.H.

Assistant Microbiologists: ERNEST LESLIE MORGAN, M.B., Ch.M.; ELSIE JEAN DALYELL, M.B.; MARIE MONTGOMERIE HAMILTON, M.B., Ch.M.; ROBERT GRANT, F.C.S.; ETHEL C. PINKERTON, B.Sc.

Laboratory Assistants: AUSTIN BURTON DUFFY (Senior Assistant); JOHN OWEN SERGEANT; JAMES FLYNN; JOHN DOWNIE STANNERS; HENRY ALDRICH GOTTO; ARTHUR JAMES WILLIAMSON; L. H. SNELL (Junior Assistant).

Laboratory Attendants: FREDERICK C. CALF (on extended leave); ALFRED ANDERSON; HENRY JOHN MOSELEY.

Clerical Staff: FLORENCE STUART WEARNE, Clerk and Librarian; HAZEL E. ANDREWS, DAPHNE I. SAUNDERS, JESSIE FORT, Shorthand-writers and Typistes; MERTON SIMPSON, Temporary Messenger.

1926.—Part I.—Table showing the Routine Examinations made for the Various Branches of the State Department of Public Health, other Government Departments, Subsidised Hospitals, &c.

	Number of Examinations. Comparative Statement.	
	1925.	1926.
Department of Public Health—		
Microbiological Laboratory	15,981	19,347
Coast Hospital	2,535	3,229
Liverpool State Hospital	1,254	1,266
Macquarie-street Asylum, Parramatta	1	....
Newington State Hospital	59	114
Rookwood State Hospital	487	495
Medical Officer of Health, Newcastle	....	34
Commonwealth Government	145	123
State Departments—		
Agriculture and Stock	2	6
Chief Secretary (Fisheries)	4	1
Education Department	34	376
Police Department	34	41
Prisons (Long Bay Gaol, &c.)	281	205
Public Works	79	217
Railways and Tramways	8	10
Stores Supply Department	37	31
Public Hospitals and Institutions other than State Hospitals	4,391	5,118
Municipal and Shire Councils	9	14
Zoological Gardens	3	....
	25,344	30,627

	1925.	1926.
Total Examinations—		
General	25,344	30,627
Rats for Plague	12,019	8,711
Grand Total	37,363	39,338

In the following Statement the Routine Work is divided into sections to disclose the purposes for which the various examinations were made :—

A.—*Microbiological Examinations.*	Number of Examinations. Comparative Statement.			
	1925.		1926.	
1. Of material from diseased persons and animals—				
Actinomycosis	3		10	
Bilharzia	10		......	
Blastomycosis	2		......	
Diphtheria (swabbings)	2,848		4,129	
,, (toxicity tests)	240		234	
,, (Schick tests)	1,056		822	
Dysentery	7		8	
Filaria	......		2	
Gonorrhœa (urines and smears)	2,487		3,372	
,, (complement deviation test)	1,585		2,145	
Hookworm	15		2	
Hydatids (sputa, smears, &c.)	70		32	
,, (complement deviation test)			64	
Kala-Azar	1		......	
Leprosy (human)	5		4	
,, (rat)	......		1	
Malaria	17		25	
Meningitis	23		71	
Mastitis (bovine)	......		5	
Plague (human)	......		1	
Smallpox	1		......	
Syphilis (Wassermann reactions)	5,186		6,002	
,, (Kahn's flocculation test)	2,060		3,464	
,, (Spirochaetes)	16		11	
Tetanus	2		3	
Tinea	3		5	
Tuberculosis	2,783		3,044	
Typhoid	882		986	
Unclassified "No growths," from Pus, &c.	690		1,010	
Typhus	......		6	
Whooping Cough	1		......	
		19,993		25,458
2. Examinations for Anthrax—				
Human beings	8		2	
Shaving brushes	11		8	
Animals (sheep, cattle, &c.)	1		1	
		20		11
3. Of Materials, &c.—				
Disinfectants	100		37	
Sewage, effluents, &c.	4		11	
Water	109		278	
Air contamination	......		77	
		213		403

	Number of Examinations. Comparative Statement.			
	1925.		1926.	
Brought forward	......	20,226	......	25,872
A.—*Microbiological Examinations—(continued)*—				
4. Examinations of Foods for bacterial contamination—				
Bread	......		3	
Fish and fish pastes	2		......	
Flour	4		......	
Meat	1		1	
Milk samples from suburban dairies for tubercle bacilli and bacterial contents	55		16	
Oysters	3		5	
Pickles	1		......	
Plum pudding	......		1	
Soup (kidney)	......		3	
Vinegar	4		......	
		70		29
5. Examinations for food poisoning	10		25	
		10		25
B.—*Pathological Examinations.*				
1. Of Animals—				
Mammals	10		8	
Birds	2		1	
Fish	1		2	
		13		11
2. Of Body Fluids—				
Blood for full and differential count	353		378	
Blood for blood typing	......		13	
Blood and urine (for urea, sugar, &c.)	434		619	
Urine—general examinations	786		746	
Fæces	54		57	
Test meal	......		2	
Calculus	1		1	
		1,628		1,816
3. Of Tissues—				
Malignant tumours	356		391	
Other conditions	785		903	
		1,141		1,294
C.—*Examinations of Parasites.*				
Ecto-parasites (fleas, ticks, etc.)	1,327		804	
Endo-parasites (round and flat worms)	8		7	
Insects (including flies and mosquitoes) and spiders	9		17	
		1,344		828
D.—*Medico-Legal Examinations.*				
Examination of Exhibits for—				
Blood stains	10		11	
Gonococci	3		5	
Seminal stains	20		33	
Spermatozoa	10		4	
Other examinations	1		1	
		44		54
E.—*Examination of Specimens for preparation of Vaccines.*				
Preparation of Autogenous Vaccines from sputa, urine, acne pustules, boils, wounds, and other septic conditions	865		693	
Preparation of stocks of anti-sera for medico-legal tests, &c.	1		......	
Examination of calf lymph	2		......	
Examination of diphtheria toxin used in Schick testing	......		2	
Silicosis experiments	......		2	
Examination of Insect Spray	......		1	
		868		698
Total	25,344		30,627	

F.—*Examination of Rats and Mice for Plague.*

Comparative Statement.

Rats Received from Rat-catching Staff of—	1925.				1926.			
	Rats.	Mice.	Total.	No. Infected.	Rats.	Mice.	Total.	No. Infected
Department of Public Health	1,702	614	2,316	...	1,114	229	1,343	...
City Council of Sydney	1,645	82	1,727	...	1,271	68	1,339	...
Sydney Harbour Trust	4,384	1,615	5,999	...	3,853	902	4,755	...
Garden Island (Naval Department)	210	22	262	...	97	1	98	...
Federal Quarantine Department	1,149	79	1,228	...	703	80	783	...
Other sources	468	19	487	...	345	48	393	...
	9,588	2,431	12,019	...	7,383	1,328	8,711	...

PART II.—REPORTS OF INVESTIGATIONAL WORK, 1926.

1.—ROUTINE EXAMINATION OF RODENTS AND THEIR ECTOPARASITES.

(E. L. Morgan and I. M. Mackerras.)

The routine examination of rats for the presence of plague was continued. These examinations have been carried out with two short breaks since 1900.

In 1926 no infected animals were found. The number of rats caught and examined has steadily decreased since 1922, with the freedom of the city from plague. In 1922, 30,038 were examined; in 1923, 19,176; 1924, 16,351; 1925, 12,850; 1926, 8,711.

Species of Fleas.—It will be seen that the fleas collected were determined as belonging to four species:—*Xenopsylla cheopis* (331); *Ctenopsylla musculi* (362); *Ceratophyllus fasciatus* (107); and *Ctenocephalus felis* (*or canis*) (2); Total, 802.

Fleas collected from Rodents examined in the Microbiological Laboratory, 1909–26.—A Statement is included (Table III) shewing the number and percentage species of fleas collected from rats and mice examined in the Laboratory from 1909–26.

Table I.—Showing the number and species of Rats examined each week, and the number and species of Fleas collected on them.

1926. Week ended—	Species of Rats examined.				No. infected with plague.	Species of Fleas and Hosts on which they were found.																Total No. of Fleas collected.
						Xenopsylla cheopis.				*Ctenopsylla musculi.*				*Ceratophyllus fasciatus.*				*Ctenocephalus felis or canis.*				
	R. norvegicus.	*R. rattus.*	*M. musculus.*	Total.		*R. norvegicus.*	*R. rattus.*	*M. musculus.*	Total.	*R. norvegicus.*	*R. rattus.*	*M. musculus.*	Total.	*R. norvegicus.*	*R. rattus.*	*M. musculus.*	Total.	*R. norvegicus.*	*R. rattus.*	*M. musculus.*	Total.	
1–2 January	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9 ,,	18	107	19	144	...	...	7	...	7	...	15	...	15	...	3	...	3	...	...	...	...	25
16 ,,	39	162	25	226	...	8	21	...	29	1	11	...	12	...	6	...	6	...	1	...	1	48
23 ,,	22	224	37	283	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30 ,,	12	89	24	125	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6 February	14	148	36	198	...	...	5	...	5	...	1	...	1	...	...	...	...	...	...	...	...	6
13 ,,	10	156	25	191	...	10	4	...	14	1	2	...	3	2	1	...	3	1	...	...	1	21
20 ,,	12	74	24	110	...	...	9	...	9	...	4	...	4	...	...	...	...	...	...	...	...	13
27 ,,	9	111	18	138	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6 March	16	135	25	176	...	...	12	...	12	...	8	...	8	...	...	...	...	...	...	...	...	20
13 ,,	25	89	17	131	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 ,,	27	123	18	168	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27 ,,	35	113	32	180	...	11	26	...	37	1	2	...	3	...	...	...	...	...	...	...	...	40
3 April	54	132	22	208	...	...	4	...	4	...	3	...	3	...	...	...	...	...	...	...	...	7
10 ,,	21	95	20	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17 ,,	31	108	27	166	...	...	42	...	42	...	26	...	26	...	3	...	3	...	...	...	...	71
24 ,,	22	223	28	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 May	13	161	24	198	...	8	9	...	17	...	14	...	14	1	2	...	3	...	...	...	...	34
8 ,,	20	172	39	231	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,,	22	128	35	185	...	12	24	...	36	3	9	...	12	1	...	...	1	...	...	...	...	49
22 ,,	25	115	44	184	...	...	7	...	7	...	21	...	21	...	1	...	1	...	...	...	...	29
29 ,,	9	121	25	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 June	3	127	28	158	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12 ,,	9	99	24	132	...	...	5	...	5	...	10	...	10	...	2	...	2	...	...	...	...	17
19 ,,	8	92	25	125	...	...	10	...	10	...	18	...	18	...	...	...	...	...	...	...	...	28
26 ,,	23	99	24	146	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 July	28	227	27	282	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,,	27	129	20	176	...	...	3	...	3	4	7	...	11	...	...	...	...	...	...	...	...	14
17 ,,	25	114	34	173	...	...	5	...	5	...	20	...	20	...	7	...	7	...	...	...	...	32
24 ,,	39	122	41	202	...	...	2	...	2	...	8	...	8	...	5	...	5	...	...	...	...	15
31 ,,	26	115	36	177	...	...	21	...	21	...	25	...	25	...	2	...	2	...	...	...	...	48
7 August	19	98	37	154	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14 ,,	18	111	42	171	...	...	5	...	5	...	7	...	7	...	1	...	1	...	...	...	...	13
21 ,,	12	173	49	234	...	...	3	...	3	...	20	...	20	...	3	...	3	...	...	...	...	26
28 ,,	15	138	16	169	...	...	5	...	5	...	2	...	2	...	3	...	3	...	...	...	...	10
4 September	19	174	32	225	...	...	3	...	3	...	31	...	31	...	11	...	11	...	...	...	...	45
11 ,,	11	122	22	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18 ,,	6	124	22	152	...	2	2	...	4	1	21	...	22	13	8	...	21	...	...	...	...	47
25 ,,	15	100	23	138	...	...	11	...	11	...	8	...	8	...	1	...	1	...	...	...	...	20
2 October	7	113	10	130	...	...	13	...	13	...	36	...	36	...	3	...	3	...	...	...	...	52
9 ,,	7	75	12	94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16 ,,	12	67	15	94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23 ,,	16	82	12	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30 ,,	16	137	18	171	...	6	16	...	22	6	16	...	22	5	23	...	28	...	...	...	...	72
6 November	21	147	32	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13 ,,	10	121	18	149	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 ,,	19	130	20	169	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27 ,,	19	124	15	158	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 December	53	100	17	170	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11 ,,	12	103	20	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18 ,,	9	227	28	264	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25 ,,	10	67	12	89	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31 ,,	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	970	6,446	1,295	8,711	...	57	274	...	331	17	345	...	362	22	85	...	107	1	1	...	2	802

APPENDIX III. Diagrammatic representation of observations of dry kata and wet kata readings, dew points, wet bulb and dry bulb temperatures, differences between indoor and outdoor temperatures, absolute humidities, and comfort votes, made at St. James' and Her Majesty's Theatres from 28th April, 1926, to 22nd March, 1927. These readings are given in Appendix V (Numbers 1-197). This chart forms a convenient method of studying the variables shown.

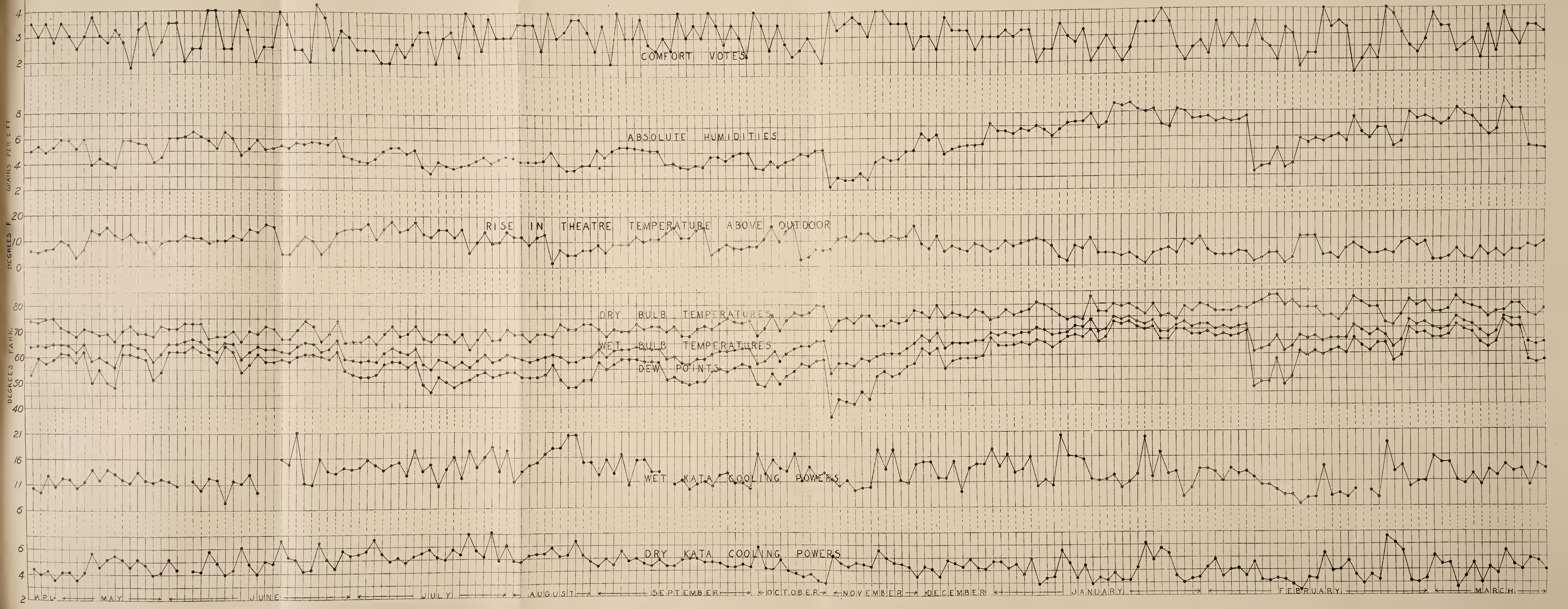


TABLE II.—Showing the numbers of Rats and Mice examined each month and the seasonal variation in the species of Fleas infesting them. The accompanying graph shows the seasonal prevalence for the period 1909–26.

1926. Month.	Cases in human beings.	Species of Rats.				No. plague infected.	No. of Fleas collected.	*Xenopsylla cheopis.*		*Ctenopsylla musculi.*		*Ceratophyllus fasciatus.*		*Ctenocephalus canis or felis.*	
		R. norvegicus.	*R. rattus.*	*M. musculus.*	Total.			Gross.	Per 1,000 Rats.	Gross.	Per 1,000 Rats.	Gross.	Per 1,000 Rats.	Gross.	Per 1,000 Rats.
January	...	91	582	105	778	...	73	36	46·27	27	34·70	9	11·56	1	1·28
February	...	45	489	103	637	...	40	28	43·95	8	12·55	3	4·70	1	1·56
March	...	153	557	114	824	...	60	49	59·46	11	13·34	...	...	...	...
April	...	91	622	99	812	...	78	46	56·65	29	35·71	3	3·69	...	...
May	...	77	569	154	800	...	112	60	75	47	58·75	5	6·25	...	...
June	...	62	540	105	707	...	45	15	21·21	28	39·60	2	2·82	...	...
July	...	125	551	143	819	...	109	31	37·85	64	78·14	14	17·09	...	...
August	...	69	614	159	842	...	49	13	15·43	29	34·44	7	8·31	...	...
September	...	50	520	92	662	...	112	18	27·19	61	92·14	33	49·84	...	...
October	...	54	380	59	493	...	124	35	70·99	58	117·64	31	62·88	...	...
November	...	101	542	92	735	...	...	...	...	...	...	...	...	...	...
December	...	52	480	70	602	...	...	...	...	...	...	...	...	...	...
	...	970	6,446	1,295	8,711	...	802	331	37·99	362	41·55	107	12·28	2	·22

TABLE III.—Return showing the number and percentage species of fleas collected from rodents examined in the Microbiological Laboratory from 1909–1926, inclusive.

Name.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	Total.	Percentage.
Xenopsylla cheopis ...	1,191	701	1,105	641	213	233	252	300	197	67	64	302	612	1,268	895	539	304	331	9,215	44·55
Leptopsylla musculi ...	514	541	1,065	442	113	371	156	108	60	63	7	202	780	757	672	639	689	362	7,541	36·48
Ceratophyllus fasciatus	210	266	375	219	31	94	72	76	57	47	30	159	503	542	376	284	309	107	3,767	18·22
Ctenocephalus canis or felis.	10	8	11	14	3	2	4	8	1	1	1	6	18	29	11	4	2	2	135	0·65
Pulex irritans	1	1	1	...	...	...	...	...	...	...	...	1	2	4	...	2	4	...	16	0·08
Pygiopsylla rainbowi...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	0·005
Echidnophaga myrmecobii.	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	0·005
Total	1,926	1,517	2,557	1,316	360	700	484	492	315	178	102	680	1,915	2,601	1,954	1,469	1,308	802	20,676	100·00

TABLE IV.—Showing the number of Rats annually examined from the first appearance of plague at Sydney in 1900 to 31st December, 1926.

Year	Period of Rat Examination.	Rats examined.				Mice examined.			Infected.							Percentage of infected to total examined.		
		Norvegicus.	Per cent.	*Rattus.*	Per cent.	*Musculus.*	Per cent.	Total examined	*Norvegicus.*	Per cent.	*Rattus.*	Per cent.	*Musculus.*	Per cent.	Total infected.	N.	R.	M.
1900 1901 1902	....	......	.....	*1900—First plague outbreak, 19th January to 9th August. *1901–2—Second plague outbreak. 12th Nov., 1901, to 8th June, 1902.														
1903	1st May to 15th Aug.	8,695	...	...	...	5,976	...	14,761	Rats. 111	...	...	...	Mice. 50	...	161	...	...	...
1904	1st Mar. to 3rd Dec.	12,169	27·76	8,225	18·76	23,428	53·48	43,822	108	44·26	73	29·92	62	25·41	243	·76	1·16	0·26
1905	Year.	11,383	53·72	5,681	17·81	14,831	46·47	31,895	78	55·32	45	31·91	18	12·77	141	·79	·88	·13
1906	”	9,275	31·49	8,694	29·52	11,478	38·97	29,447	46	26·44	89	51·15	39	22·41	174	·49	1·02	·34
1907	”	8,628	27·2	10,749	33·9	12,244	38·7	31,621	57	26·03	143	65·29	19	8·68	219	·66	1·3	·15
1908	”	7,622	28·39	9,207	34·29	10,020	37·32	26,849	82	46·86	78	44·57	15	8·57	175	1·075	·84	·14
1909	”	6,752	25·26	11,259	42·08	8,726	32·66	26,737	22	12·36	138	77·53	18	10·11	178	·32	1·22	2·06
1910	”	5,701	24·98	10,076	44·15	7,044	30·87	22,821	4	80·	1	20·	...	...	5	·07	–·00	...
1911	”	6,025	26·45	10,830	47·55	5,919	26·	22,774	...	...	...	...	...	...	...	...	...	...
1912	”	6,510	37·82	7,922	46·18	2,722	16·	17,154	...	...	...	...	...	...	...	...	...	...
†1913	”	5,020	47·29	5,477	51·59	118	1·1	10,615	...	..	...	...	...	...	...	...	...	...
1914	”	3,732	39 58	5,487	58·14	220	2·33	9,439	...	...	...	...	...	...	...	...	...	...
1915	”	3,592	37·13	5,946	61·48	135	1·89	9,673	..	...	...	...	...	...	...	...	...	...
1916	”	2,807	35·33	4,967	62·58	167	2 1	7,941	...	...	...	...	...	...	...	...	...	...
1917	”	3,026	36·76	5,110	62·08	95	1·15	8,231	...	...	...	...	...	...	...	...	...	...
1918	”	2,601	33·43	5,109	65·67	69	·88	7 779	...	...	...	...	...	...	...	...	...	...
‡1919	”	849	26 82	2,303	72·76	13	·41	3,165	...	...	...	...	...	...	...	...	...	...
1920	”	2,707	40·6	3,960	59·4	...	...	6,667	...	...	...	...	...	...	...	...	...	...
1921	”	5,588	33·59	10,270	61·74	775	4·53	16,633	24	38·71	37	59·67	1	1·61	62	·42	·36	·12
1922	”	8,433	28·09	12,822	42·68	8,783	29·25	30,038	43	50·6	13	33 73	13	15·67	86§	·50	·23	·14
1923	”	3,749	19·55	10,147	52·91	5,280	27·53	19,176	...	...	...	...	...	...	...	...	...	...
1924	”	1,896	11·59	10 954	66·99	3,501	21·41	16 351	...	...	...	...	...	...	...	...	...	...
1925	”	1,529	12·72	8,059	67·05	2,481	20·23	12,019	...	...	...	...	...	...	...	...	...	...
1926	”	970	11·14	6,446	74.	1,295	14·86	8,711	...	...	...	...	...	...	...	...	...	...
	Total......	120,564	28.73	179.700	42.83	119,294	28·44	419,558	464	36·17	634	49·37	185	14·45	1,283	·41	·43	·17

* Destroyed 1900-1902, 215,286. No record was kept during this period of the actual number of rats examined, but they all belonged to one of two species—*R. norvegicus* and *R. rattus*. The infected specimens were all *R. norvegicus*. Of the 215,286 rats destroyed between 1900 and 1902 there were about an equal number of each species, *R. rattus* predominating along the wharf area, and *R. norvegicus* inland.

† Examination of rats was suspended during the months of August, September, and October, owing to an outbreak of smallpox.

‡ Examination of rats was greatly curtailed owing to the influenza epidemic.

§ 89 Plague infected animals were found, comprising 86 rats and mice, 2 cats, and 1 guinea-pig.

2 (A).—TYPHOID FEVER.

Report on Two Outbreaks of Typhoid Fever at Goulburn Gaol, 1926-27.

(E. L. Morgan).

First Outbreak.—Dr. F. M. Suckling, Assistant Medical Officer of Health, who investigated the first outbreak has prepared the following summary :—

Eighteen prisoners were admitted to the local district hospital from the gaol during the period 8th February, 1926, to 27th March, 1926, of which seventeen were notified as cases of typhoid fever. One prisoner (see below) was admitted to Penrith Hospital on 24th February, 1926, as a case of typhoid fever.

According to dates of cases of illnesses as ascertained, the outbreak covered the period of 18th January, 1926, to 4th March, 1926.

Prisoners only were the sufferers in so far as the inmates of the gaol were concerned ; and there was one death.

Of the seventeen cases notified from Goulburn, six gave positive Widal reactions, six proved negative, and five were not tested owing to the fact that they had previously undergone preventive anti-typhoid inoculation.

The action taken to deal with the outbreak was as follows :—

(*a*) Investigation by a medical officer of the Department of Public Health as to causation and control of the outbreak.
(*b*) Removal of patients to the district hospital, and isolation of suspects in the gaol infirmary and cells, pending diagnosis.
(*c*) Wholesale preventive anti-typhoid inoculation of prisoners and staff.
(*d*) Precautions taken with regard to food supplies and sanitary service.

Probable Cause of the Outbreak.—Investigations narrowed this down to two possibilities :—

(*a*) The question of a carrier, or carriers, in the gaol spreading the disease through the food supply, or by some other method.
(*b*) Introduction from an outside source.

Exhaustive bacteriological examinations of nineteen prisoners and five warders who gave a previous history of typhoid fever returned negative results as to the presence of the typhoid bacillus in their excretions, and although the possibility of intermittency of carriers could not altogether be overlooked, still it seemed after due inquiry that the cause was most likely due to an extraneous source, and such was in evidence, *e.g.*, a Public Works Department employee, P. N., who had come from Sydney, began work on some sewer excavations at the gaol on 5th November, 1925. Becoming too ill to work, he was admitted to the Goulburn Hospital on 14th December, 1925, and was there ascertained to be a case of typhoid fever. On investigating the history of this man, it was found that he was probably ill and infective when he began work at the gaol; and that whilst there he had access to a range of earth closets used also by prisoners. Prisoners would also be responsible for the removal of the pans and cleansing of these closets, and thus a means of spread of infection was possible from this employee to the prisoners. In this connection it is to be noted that of the prisoners subsequently affected with typhoid fever, four were sweepers and cleaners, three sanitary tub men, one a laundryman, and one a baker.

The outbreak was confined within the precincts of the Goulburn gaol, except in one instance which involved the Emu Plains Prison Farm. A prisoner was notified as suffering from typhoid fever from this farm on 24th February, 1926, but he proved to be a transferee from the Goulburn Gaol, where he no doubt had contracted the infection. This man had been a sweeper at the gaol and was transferred to Emu Plains on 6th February, 1926. He was received into the Penrith Hospital. As a result of anti-typhoid inoculation and other precautions taken, no further cases were notified from the Emu Plains Farm.

The outbreak accordingly was responsible for a total of eighteen cases of typhoid fever (Goulburn Hospital, 17 cases; Penrith Hospital, 1 case.)

Second Outbreak.—Following the epidemic at the beginning of 1926, a second outbreak occurred at the end of 1926 and the beginning of 1927, in which seven prisoners contracted the disease, of whom two died. The approximate dates of commencing illness are given below :—

Case No.	1.	Date of commencing illness,		18th	December,	1926.
,,	2.	,,	,,	20th	,,	1926.
,,	3.	,,	,,	29th	,,	1926.
,,	4.	,,	,,	3rd	January,	1927.
,,	5.	,,	,,	6th	,,	1927.
,,	6.	,,	,,	11th	,,	1927.
,,	7.	,,	,,	1st	February,	1927.

In each case positive Widal reactions or cultures of *B. typhosus* were obtained from the patients. In the seventh case *B. typhosus* was isolated from the intestines after death, the patient having died of heart failure after four days' illness.

The occupation of the patients were widely divergent, *viz.*, outdoor work, tarring, cooking, washing, farming, and one was a hospital patient.

At the commencement of the outbreak, more than half the gaol inmates had been inoculated during the previous twelve months, and inoculation of the remainder was immediately undertaken.

Prior to the first epidemic early in 1926, there had been no cases of typhoid fever at Goulburn Gaol for many years, and the assumption was that that epidemic was introduced from an outside source. However, the possibility of the presence of a " carrier " was not altogether excluded, although at the time of that outbreak bacteriological examinations were made of specimens from nineteen prisoners and five warders who gave a previous history of typhoid fever with negative results as to the presence of typhoid bacilli. The occurrence of a second outbreak of typhoid fever rendered it imperative to exclude the possibility of the presence of a carrier who might have caused either one or both outbreaks. As examinations of excreta for typhoid bacilli can only be carried out satisfactorily on fresh specimens, an assistant was despatched from the Microbiological Laboratory on 8th January, 1927, and established in a room at the gaol hospital with sufficient laboratory equipment to carry out an exhaustive investigation. At that time it appeared probable that both outbreaks had arisen from the same source.

On inspection the general appearance of the gaol was excellent. The gaol was built on a semi-circular plan, the wings and kitchen radiating from the chapel as a centre like the spokes of a wheel, the order being A wing, B wing, kitchen, C wing, then D wing; each being separated from the adjacent building by exercise yards. Surrounding the wings were the workshops, laundry, bakehouse, library, &c. The water used came from the town supply, and the disposal of excreta was effected by water sewerage. Flies were not unduly prevalent, being much more noticeable outside than inside the gaol, though enquiry elicited the fact that they were very bad at times, as is usual in most country towns of New South Wales.

In addition to the water sewerage, there was a further old underground reticulation which carried off the surface water, but even if defective, it is not clear how this could have served as a source of infection.

The prisoners were housed in separate wings, and as four cases of typhoid came from three separate wings, and in the first epidemic cases came from all the wings, it was evident that the cause of the epidemics must have been some factor common to each wing.

With regard to the handling of food: Bread was baked at the gaol under the direction of a warder. Kenmore Asylum received its supply from this source, and no cases of typhoid had occurred at that institution. The kitchen staff was concerned with the cooking of food and the apportioning of the prisoners' rations. Here there was a possible source of contamination. The warder usually in charge of the kitchen had had typhoid, but in the three to four weeks preceding the second outbreak this warder had been relieved by ten other warders, one of whom also had typhoid fever. The kitchen staff of prisoners had been completely changed since the first epidemic, and none of the prisoners employed in the kitchen gave any history of typhoid or continuous fever. All the vegetables used were cooked, hence if food was the source of infection it was apparent that contamination must occur during the apportioning or distribution. In addition to the warder and prisoners on the kitchen staff, each day a delegate was selected by the prisoners themselves to superintend the apportioning of rations.

Next, a certain number of prisoners were on a milk ration. The first two cases of typhoid came under this category, but the last two did not, though it was not possible to ascertain definitely whether they did or did not receive milk from other prisoners.

The milking was done at the gaol by a prisoner in charge of a warder. The bails had a well-drained concrete floor, water was laid on, and although heavy rain was experienced prior to and during my visit the bails and surrounding ground were very clean. After the first epidemic of typhoid the prisoner who did the milking was replaced by another prisoner.

The evening's milk was always boiled and the morning's milk was boiled during the summer, so that if the milk was the source of infection it must—as in the case of other foods—have been contaminated during its distribution. The milk was distributed by the warders, who dipped a measure into it and then poured it into the prisoners' mugs. Most of the warders were at times engaged in this distribution, and as several had had typhoid fever another possible source of infection was present.

Disposal of Excreta.—Each prisoner was supplied with a night tub, which he emptied; the tubs were then taken over by a sanitary squad which thoroughly washed them and subjected them to steam sterilization. These tubs were dry when returned to the cells at night, and on the whole did not appear to be a probable source of infection.

Before methodically examining excreta from the whole of the gaol inmates, the warders, the prisoners who handled the food, and the prisoners who had had typhoid fever, were examined. In the latter group prisoner No. 63 was found to be excreting large numbers of typhoid bacilli in both his urine and fæces. An investigation into this prisoner's history, which is given below, strongly pointed to him as being the source of the second epidemic.

The gaol authorities were notified on 23rd January that this man was a carrier. After that date only one case of typhoid fever developed, and in this case the date of infection would almost certainly be before the isolation of prisoner No. 63. A methodical examination was then made of all the prisoners in the gaol, repeated examinations being made in cases that gave a previous history of typhoid fever.

The examinations carried out were as follows:—

Staff.	
Fæces	62
Urine	54
Prisoners.	
Fæces	262
Urine	204
Blood	9
Intestines	1
Total	592

B. typhosus was isolated from the urine and fæces of prisoner No. 63, and from the intestines of Typhoid Case No. 7. The remaining examinations gave negative results.

The isolation of *B. typhosus* from prisoner No. 63 raised an interesting question with regard to the routine examination of specimens of fæces and urine from recovering typhoid patients in the country.

This man suffered from typhoid fever during the first outbreak early in 1926, and prior to his discharge from the Goulburn District Hospital a specimen of fæces was forwarded to the laboratory on 12th May, 1926, and was examined for typhoid bacilli with negative results. This specimen must have been at least twenty-four hours old when examined, so an experiment was carried out at the gaol to determine the viability of *B. typhosus* in this man's fæces and urine.

Faeces passed during the night were examined the following morning, when positive cultures were obtained. The fæces were then kept twenty-four hours at room temperature, and cultures were again made. This experiment was twice tried with untreated fæces and once on fæces mixed with 10 per cent. glycerine. On each occasion no typhoid colonies were isolated after a further twenty-four hours. A similar experiment with the urine showed a marked diminution in the number of colonies obtained from a specimen of urine which was allowed to stand for twenty-four hours.

This experiment is consistent with the known fact that little value can be attached to negative results on fæces sent from the country where specimens are more than twenty-four hours in transit.

History of Carrier No. 63 (*Reg. Papers* 27/50974).—Prisoner No. 63 was admitted to Goulburn Hospital with typhoid fever on 27th March, 1926, and returned to the gaol on 21st May, 1926. A specimen of his fæces was examined in this laboratory on 12th May, 1926, with negative results, but there is no record of a specimen of urine having been examined.

On returning to the gaol he was kept in the gaol hospital till 23rd November, 1926, when he returned to his cell in B wing, and resumed his work of boot-making; his actual duties being the making of police boots and the repairing of warders' boots. He at no time was occupied in the making or repairing of prisoners' boots.

Owing to the nature of the illness that caused him to be kept in the gaol hospital as a patient, he had never acted as a delegate to the kitchen, so it would be impossible for him to have personally handled any food except his own. In this connection the question of trafficking " arises, but in a personal interview he denied that he had carried out any " trafficking " since returning to his cell, so the question of a fly-borne infection was looked into.

While in the gaol hospital his excreta was passed first of all into disinfectant, and on completion of the water sewerage the patients in the hospital had the use of a water closet. Thus, flies would not have had access to his excreta during this period. Inquiry elicited the fact that he was a man of particularly dirty habits, and on many occasions during the night he would soil his bed rather than go to the lavatory. Moderate numbers of flies were present in the cells and in the kitchen, but on each of my visits it had been cloudy or raining, so as is usual under these conditions flies did not appear to be unduly prevalent, though the chief warder informed me that they were prevalent early in December and again early in January. Several of the prisoners stated that they were not worried by flies, though one of the prisoners said he found them a nuisance.

The cell occupied by No. 63 was about halfway along the ground floor of B wing, and the window of his cell was practically opposite the window of the kitchen, being a distance of about 50 feet apart. A brick wall some 10 feet in height was situated midway between his cell and the kitchen. It is easy to imagine that the cell of a man of his ascertained dirty habits would prove a considerable attraction for flies, and the close proximity of his cell to the kitchen would afford the greatest opportunity for the subsequent infection of food.

The first case of typhoid fever occurred on December 18th, subsequent cases occurring on 20th and 29th December, the 3rd, 6th and 11th January. These dates agree with the availability of this prisoner as a source of infection, and the scattered cases are consistent with a fly-borne infection. It is quite probable however, that there would have been a considerable increase in the number of cases had it not been for the fact that at the time of the commencement of the outbreak one half the occupants of the gaol were inoculated; and, of the seven cases recorded, only one occurred amongst the prisoners who received anti-typhoid inoculation in the early part of 1926, though this group included more than half the inmates of the gaol.

Immediately the presence of a carrier was ascertained the usual precautions for the prevention of the spread of infection were undertaken.

The presence of a carrier excreting large numbers of typhoid bacilli must always remain a menace in a restricted community, especially when that person is already receiving the greatest punishment legally awarded under a government where the death penalty is not enforced.

2. (*b*) REDUCTION OF TYPHOID FEVER RATE AT FORBES, FOLLOWING PREVENTIVE INOCULATION.

(E. L. Morgan.)

Forbes is situated in the central western slopes of New South Wales on the north bank of the Lachlan River, 292 miles west of Sydney.

The rate of incidence of typhoid fever in Forbes has always been much higher than that of adjacent towns, and on investigation by this Department the only conclusion arrived at was that Forbes was an endemic centre.

The pan system of sanitation was introduced in 1904, but in spite of this the typhoid incidence rate still remained high.

In 1914 the Forbes Municipal Council, on the advice of the medical practitioners of the town, established a depot at the town hall for inoculation against typhoid fever.

This Department supplied the anti-typhoid vaccine, and contributed a small amount towards payment of the doctors' fees. Approximately half the population was inoculated. Since 1914 inoculation against typhoid fever has been regularly carried out every two years. Taking the 1911 census figure as the average population, the yearly case incidence of typhoid fever was 9·26 per 1,000 during the eight years (1907–1914 inclusive) before public inoculation was instituted. The yearly case incidence for the next six years (1915–1920 inclusive) was 5·42 per 1,000, a decrease of a little more than 40 per cent., and for the next period of six years (1920–1926 inclusive) 2·12 per 1,000, a further decrease of more than 60 per cent.

The essential services of the town have not been altered, and apart from hypothetical considerations, it would appear that the reduction of the rate of incidence of typhoid fever is entirely attributable to the preventive inoculation. This contention receives further support from the following facts :—

(*a*) In 1915, the year following the institution of preventive inoculation, twenty-seven cases of typhoid fever were notified. Only three had been inoculated, and of these one developed the disease within a few days of the last injection, and two were very mild cases.

(*b*) In reply to a recent inquiry the local practitioners state that conditions similar to those of 1915 still exist.

(*c*) During the first campaign in 1914 approximately half the population was inoculated. At each subsequent biennial campaign approximately 25 per cent. of the population has submitted to inoculation, and as this would include both new inoculations and re-inoculations, it is reasonable to assume that at least three-quarters of the inhabitants keep themselves adequately protected. On this assumption the rate of incidence of typhoid fever should be reduced by 75 per cent., and the figures quoted (2·12 per 1,000 for the last six years) as compared with 9·26 per 1,000 for the eight years prior to inoculation show a reduction of slightly more than 75 per cent.

Tables and a graph are appended showing the population, the number of notified cases of typhoid fever, and the number of inoculations that have been carried out. The population figures were supplied by the Government Statistician. For the years 1907–1914 the population at the 1911 census has been taken as the average population.

For purposes of comparison the figures for Parkes have been included. Parkes is a town about 20 miles from Forbes, comparable in size and climatic conditions. No preventive typhoid inoculation has been carried out there, and the figures for this town serve to show the variation in the yearly incidence of typhoid fever in that portion of the State.

Table I.—TYPHOID FEVER.—Comparative figures for the Municipalities of Parkes and Forbes for the years 1907–1926 inclusive.

Year.	Forbes Municipality.			Parkes Municipality.		
	Population.	No. of cases of typhoid fever.	Cases per 1,000 of population.	Population.	No. of cases of typhoid fever.	Cases per 1,000 of population.
1907	......	30	6·77	......	3	·98
1908	......	29	6·55	......	6	1·97
1909	......	52	11·74	......	11	3·6
1910	......	27	6·1	......	17	5·56
1911	4,429	33	7·45	3,053	9	2·95
1912	......	39	8·81	......	6	1,97
1913	......	63	14·22	......	3	·98
1914	......	55	12·42	......	5	1·64
1915	4,405	27	6·13	3,487	10	2,87
1916	4,407	41	9·3	3,467	21	6·06
1917	4,401	24	5·45	3,545	14	3·95
1918	4,397	19	4·32	3,638	22	6·05
1919	4,387	19	4·33	3,808	8	2·1
1920	4,380	13	2·97	2,927	43	10·95
1921	4,390	8	1·82	4,030	15	3·72
1922	4,530	10	2·21	4,130	7	1·69
1923	4,510	16	3·55	4,200	17	4·05
1924	4,600	10	2·17	4,630	4	·86
1925	4,650	6	1·29	4,840	5	1·03
1926	4,680	8	1·71	5,040	16	3·17

Table II.—Public Anti-Typhoid Inoculations, Municipality of Forbes, 1914–1926.

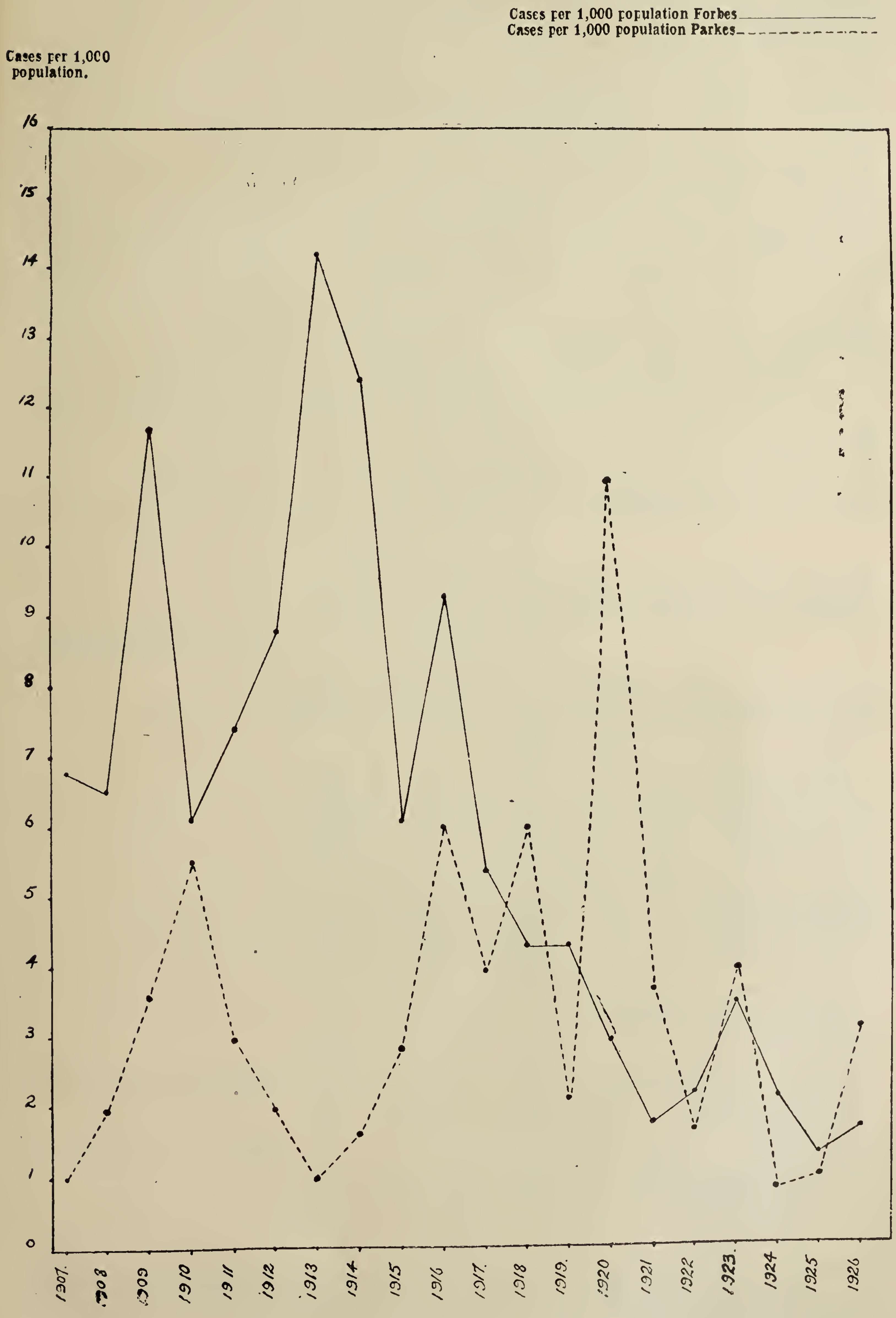
Date of Public Inoculations.	No. of Persons Inoculated.
Sept.-Oct., 1914	2,059
January, 1917	909
Sept.-Oct., 1918	1,023
September, 1920	*
Sept.-Oct., 1922	*
October, 1924	*
November, 1926	1,207

*Figures not available. Approximately over 1,000 people inoculated at each campaign as estimated from the amount of vaccine used.

Table III.—Typhoid Fever Incidence, Municipalities of Forbes and Parkes, 1907–1926 inclusive.

Period.	Forbes.	Parkes.
	Yearly average per 1,000 population.	Yearly average per 1,000 population.
1907–1914 inclusive	9·26	2·46
1915–1920 „	5·42	5·4
1921–1926 „	2·12	2·38

Graph showing the diminution of typhoid fever incidence at Forbes following biennial anti-typhoid inoculation in 1914. In the adjacent town of Parkes—broken line—there has been no inoculation against typhoid fever.



3. THE SCHICK TEST IN NEW SOUTH WALES, FOURTH REPORT.

(E. L. Morgan.)

The systematic testing of children for susceptibility to diptheria by means of the Schick test, which was commenced in 1923, was continued whenever arrangements could be made for a medical officer to be absent from the Laboratory for a few days. It was found, however, that such absences very seriously interfered with the work of the branch, and on several occasions in 1926 it became necessary to cancel a tour after parents' consents had been obtained and arrangements made by the local council and school authorities for opening a depôt for application of the test. As pointed out in the Report for 1924, a medical officer specially appointed to take charge of this work is needed.

I would, however, raise the question whether satisfactory progress is being made in diphtheria prevention. The Schick test is merely a means to an end—the end being the protection of susceptible children against diphtheria by immunisation. The test itself does not confer any immunity; it merely distinguishes those likely to become infected from those with natural immunity. But what are the facts ! A country campaign is organised, necessitating dislocation of office work and home life for a week or more, and the spending of two or more nights in train travelling. Three or four hundred children are tested and the names of those found susceptible are reported to the local and school authorities. But usually only a small percentage of these children receive injections of toxin antitoxin. As often as not the parents will not consent to have their children immunised, and all the Department's work and expense is thrown away. To secure an effective response there must be a well organised and widespread publicity campaign which should stress the liability of young children to contract diphtheria unless thay are protected by immunisation.

Another matter for consideration is whether it would not be advisable for the Department to concentrate its efforts on securing immunisation of all children under school age without a preliminary Schick test. Children under 6 or 7 years of age are the most susceptible to diphtheria, and the death-rate in this group is about four times that of children between the ages of 6 and 14 years. It is claimed that diphtheria could practically be eliminated from a community if all children under the age of 7 years were immunised, and this might be done without using the Schick test.

Attention was drawn in the report of this branch for 1925 to the fact that although 53 per cent. of the diphtheria notifications for that year were from the Metropolitan area where there are approximately 200,000 children of school age, only a fraction of the tests so far carried out have been in that area. Little or no interest has so far been shown either by local authorities or the schools in application of the test or in immunisation.

The following return shows the districts throughout the State in which the test has been applied during the years 1923–1926 inclusive :—

District.	Year Test Applied.	No. of Children Tested.	Number Positive.	Per cent. Positive.	Remarks.
		METROPOLITAN DISTRICT.			
Carlingford (Municipality)	1926	170	25	14·07	
Cleveland Street Public School (Redfern Municipality).	1924	174	40	23·0	
Roylestone Home (Glebe Municipality)	1925	31	1*	...	*Probable that all other susceptible children had been removed to hospital with diphtheria, when the test was made.
Total	...	375	...	...	
		COUNTRY DISTRICTS.			
Municipalities and Towns—					
Barmedman (see Bland Shire)	1926	...	...	...	
Bedgerebong (see under Forbes Municipality).	1923 1924				
Cassilis (Merriwa Shire)	1924	18	13	72·2	
Cessnock (Municipality)	1924	174	50	29·0	
Coonamble (Municipality)	1925	86	20	24·0	
Corowa (Municipality)	1925	213	74	36·09	
	1926	62	20	33·0	
Cowra (Municipality)	1925	209	66	31·57	
Forbes (including Bedgerebong)	1923 1924	324	59	18·2	
Gulargambone (see under Wingadee Shire).					
Lithgow (Municipality)	1926	316	79	25·0	
Merriwa (Merriwa Shire)	1924	58	32	55·1	
Narrabri (Municipality)	1924	347	65	18·7	
	1925	96	18	18·7	
Narrabri West (Municipality)	1924	32	...	...	
Parkes (Municipality)	1923 1924	384	122	31·7	
Quambone (see under Wingadee Shire).					
Wyalong (Municipality)	1926	37	11	29·73	
Wyalong West (Bland Shire)	1926	144	60	42·25	
Shires—					
Bland Shire (see also West Wyalong)	1926	114	64	52·0	Schools at Barmedman, Ungarie, Girral, and Mallee Plains.
Lake Macquarie Shire, Awaba	1926	61	28	46·0	
Blaxland Shire, Anarel School (Sodwalls)	1925	18	11	61·11	
Stroud Shire, Tea Gardens	1925	80	27	33·75	
Waugoola Shire	1925	233	107	45·92	(Eighteen schools Public, 16; Convent, 2).
Wingadee Shire—					
Gulargambone Public School	1925	80 } 112	39 } 50	45·0	
Quambone Public School	1925	32	11		
	...	3,118	...	...	
Metropolitan District	...	375	...	...	
Country District	...	3,118	...	...	
Total	...	3,493	...	...	

Percentage of Positive Results.—The larger population of the towns was found to be the main factor of influence in lowering the percentage of positive results, which ranged from 14·07 at Carlingford (a metropolitan municipality) to as high as 72·2 at Cassilis, a small and comparatively isolated town in the Merriwa Shire. Practically all the tests were of children between the ages of 5 and 15 years.

4. SYDNEY MILK SUPPLY.—*Bacterial Counts made on 406 samples of Milk from Suburban Dairies and Country and Suburban Distributing Companies, during the period March to July, 1926.*

(F. W. Ferguson.)

These examinations were undertaken in connection with the bacterial standard decided upon for milk. The counts on the samples were carried out during the period March to July, 1926. Four hundred and forty-four samples were submitted, but only 406 of these could be examined. The samples submitted were classified into two main series—(1) milk from suburban dairies; (2) country milk.

1. *Milk from Suburban Dairies.*—The samples from this source were subdivided again into two divisions according to whether the milk had been cooled or not.

(a) *Milk samples, water and brine cooled.*—Under this heading are grouped 130 samples received from 21 suburban dairies. This division included samples taken direct from the cows, samples from the mixed milk before passing over the cooler, samples after passing over the cooler, and samples taken from the delivery carts, either from a tank or can, or from bottles. The results have been summarised under these headings. While the results are comparable as regards the first three groups in that milk in each group is of relatively the same age, the samples included under the last group are not uniform in regard to time of handling; it was to be expected, therefore, that the samples collected from the carts would show greater variation in the counts than the other samples.

Of the 44 samples from the cows' teats, 17 were sterile or had under 100 colonies per c.c., 12 had under 500, and all, with the exception of two, were under 10,000. The two exceptions were one specimen that showed over 200 million colonies, probably indicating that the quarter was infected with mammitis, and one which was not strictly from the cow's teat, but from the cup of the milking machine placed over the teat.

The samples taken before and after cooling do not show great divergence in the counts; in both sections the largest number of samples showed counts between 10,000 and 100,000. The counts, however, showed that the bacterial content had increased considerably above that of the milk from the teats. The milk samples from carts again were mostly in the 10,000 to 100,000 group, but there were a greater number of specimens with higher counts and four showed counts of over a million.

(b) *Samples not subjected to cooling.*—Under this heading are included 180 samples from 30 dairies. The samples were taken from cows' teats, from storage vats and from carts. The counts are again summarised under those headings, and show results similar to those of the cooled milk series, with the exception that the samples from the storage vats or cans showed more counts over 100,000 than in the former series.

The most striking feature in the two series is the sudden increase in the counts in the mixed milk as compared with the counts from the cows' teats. This increase is not, in my opinion, due to multiplication, but rather to infection of the milk from dust, &c., while standing in the churns or tanks, or possibly in some cases, to the inclusion of milk from infected udders or quarters.

2. *Country Milk.*—In this series are included 96 samples of milk from the country for distribution in Sydney. Some of the samples were taken at receiving depots in the country, others at depots in Sydney. In some instances the milk was pasteurised in the country; in other cases in Sydney. In the summary the results are shown separately according to whether the milk was pasteurised in the country or in Sydney. In both cases the milk before pasteurisation showed a large proportion of samples with counts above one million; after pasteurisation the counts were reduced to under 100,000 in almost all cases. In 5 cases the count after pasteurisation was reduced under 1,000, and in two of these under 100 bacteria per c.c. It is noteworthy that in these two cases pasteurisation was by the Holding method as opposed to the Flash method. In the samples from the storage vats the counts showed a tendency to rise.

Full details of all the samples examined are given in the attached tables.

Samples of Milk, Water and Brine Cooled, from Suburban Dairies.

Bacterial Count per c.cm.

Sample taken from—	Bacterial Count per c.cm.								
	No. of Samples.	0–100.	100 to 500.	500 to 1,000.	1,000 to 10,000.	10,000 to 100,000.	100,000 to 500,000.	500,000 to 1,000,000.	Over 1,000,000.
Cow's teat	44	17	12	6	7	1	...	...	1
Vat or can before cooling	22	...	...	...	5	16	1	...	...
Vat after cooling	23	...	...	...	3	14	5	1	...
Delivery cart tank, tap or bottle	41	...	...	...	2	20	13	2	4
	130	17	12	6	17	51	19	3	5

Samples of Pasteurised Milk from Country and Suburban Distributing Companies.

Sample taken from—	Bacterial Count per c.cm.								
	No. of Samples.	0–100.	100 to 500.	500 to 1,000.	1,000 to 10,000.	10,000 to 100,000.	100,000 to 500,000.	500,000 to 1,000,000.	Over 1,000,000.
Pasteurised in City—									
On arrival in Sydney	20	...	...	...	2	...	5	1	12
After pasteurisation	7	...	...	...	2	5	...	...	...
Storage vats	12	...	...	...	1	7	...	1	3
Cart	2	...	...	...	...	...	...	...	2
Pasteurised in Country—									
Receiving vats from suppliers	22	...	...	...	1	4	5	...	12
After pasteurisation	14	2	...	3	6	2	1	...	...
Storage vats	15	...	...	...	1	10	3	...	1
Cart	4	...	...	...	...	1	3	...	...

Samples of Milk, Not Cooled, from Suburban Dairies.

Sample taken from—	Bacterial Count per c.cm.								
	No. of Samples.	0–100.	100 to 500.	500 to 1,000.	1,000 to 10,000.	10,000 to 100,000.	100,000 to 500,000.	500,000 to 1,000,000.	Over 1,000,000.
Cow's teat	55	31	12	5	7	...	...	...	...
Vat or can	78	...	...	...	16	33	21	6	2
Delivery cart, tank, tap, or bottle...	47	...	...	1	5	17	17	6	1
	180	31	12	6	28	50	38	12	3

5. DENGUE FEVER—THE 1925–26 OUTBREAK IN NEW SOUTH WALES.

(E. W. Ferguson.)

Definition.—Dengue fever is a disease of unknown origin, spread by the bite of infected mosquitoes—*Aedes* (*Stegomyia*) *ægypti* L.—and characterised by fever (often recurrent), headache, backache, pains in the orbits and in the bones and joints, and in many cases by the presence of rashes. Coryza is almost invariably absent and the symptomatology varies in different cases and even in different outbreaks.

Previous Outbreaks in Australia.—A full account of previous records of the occurrence of dengue in Australia has already been given by Cleland, and it would serve no good purpose to repeat them in detail here. Certain aspects, however, require comment and I therefore append a tabular statement in order to facilitate discussion :—

Table I.—Previous Outbreaks of Dengue Fever in Eastern Australia.

Year.	Place.	Reference.	Remarks.
1873	Melbourne	Aus. Med. Jl., Apr., 1873, 160	Ship outbreak—" Charles Auguste."
1885	Queensland	Aus. Med. Gaz., IV, 177	Prevalent at Rockhampton.
1885	Sydney	Aus. Med. Gaz., IV, 310	Ship outbreak—" Gunga."
1886	Victoria	Aus. Med. Jl., July, 1886, 291	Natimuk epidemic—see discussion.
1894	Thursday Island	Aus. Med. Gaz., XIII, 252	Very prevalent.
1895	Queensland	Aus. Med. Gaz., XIV, 79	Prevalent at Townsville.
1897	Queensland	Aus. Med. Gaz., XVI, 235 Intercol. Med. Jl., II, 450	Prevalent and mild.
1898	Queensland	Intercol. Med. Jl., III, 143 Aus. Med. Gaz., XVII, 98 Aus. Med. Gaz., XVII, 124	Two epidemics swept through Queensland in quick succession.
1898	New South Wales	Aus. Med. Gaz., XVII, 135	Invaded the North Coast.
1899	Queensland	Aus. Med. Gaz., XIX, 42	1 death in Brisbane.
1901	Queensland	Aus. Med. Gaz., XXI, 46	2 deaths in Brisbane.
1904–5	Queensland	Aus. Med. Gaz., XXIV, 616	Severe epidemic, 94 deaths in Brisbane.
1905	Thursday Island	Aus. Med. Gaz., XXIV, 91	Part of same epidemic.
1905	New South Wales	Aus. Med. Gaz., XXIV, 185	Invaded the North Coast.
1908	Queensland	Aus. Med. Gaz., XXVII, 121	Cases recurring in North Queensland.
1916	Queensland	As under	Extensive epidemic.
1916	New South Wales	Jl. Hygiene, XVI, 319	Prevalent in Northern rivers (Cleland, Bradley, and McDonald's investigations).
1925–26 ...	Queensland	....	Widespread.
......	New South Wales	Present Report	Widespread in northern half of the State.

Excluding the two ship outbreaks, which were purely importations, and do not appear to have spread to the shore population, and excluding also the Natimuk outbreak, dengue fever, at any rate in eastern Australia, can be grouped in five great epidemic waves separated by intervals of about ten years. In New South Wales the disease has in each case been limited to a single season, and the intervals of freedom are well defined, but in Queensland each epidemic spreads over a period of two or three years and the intervals are less clearly seen. This difference in the duration of the outbreaks is associated with the habits of the known vector. In the warmer parts of Queensland mosquito-breeding may go on all the year round, and the epidemic does not end until practicably all susceptible individuals have been infected. On the other hand, in New South Wales, and probably in parts of southern Queensland, breeding of *Aedes ægypti* L. is confined to the warmer months and stops during the winter, this season being passed in the egg stage. Since carriers are unknown, and since experiments have failed to produce any evidence that the infection can be carried by the mosquito over the egg stage, it follows that the disease must die out in the winter in the cooler, more southern or more elevated districts, and will not reappear unless reintroduced from outside. Dengue appears, from statements received, to be endemic in parts of North Queensland.

Cleland gives no record of the occurrence of dengue in the Northern Territory, and only refers—somewhat vaguely—to outbreaks in North-West Australia. The disease, however, certainly occurs in these parts with the same frequency as in the northern parts of Queensland with a similar climate, 392 cases having been notified from the north-western coast of Western Australia during the years 1919–23.

Among the outbreaks recorded as being probably dengue is that which occurred at Natimuk in Victoria in 1885. It appears to me extremely improbable that the disease was really dengue fever, mainly on account of the known distribution of *Aedes ægypti* L. If the disease was really dengue, then one would have to suppose that some other species of mosquito does at least occasionally serve as a transmitting agent, though no other species than *A. ægypti* has been proved capable of doing so. Until further evidence is available, I think that the Natimuk epidemic should be removed from the list of Australian outbreaks of dengue.

Distribution in New South Wales.—Previous outbreaks have occurred in New South Wales in 1898, 1906, and 1916. In all of these the disease was confined to a few towns on the Tweed, Richmond, and Clarence Rivers, in the North Coastal district. There does not appear to be any evidence that the disease ever extended south of this area, though imported cases have frequently occurred as far south as Newcastle.

The information on which this report is based is contained partly in the reports of departmental officers detailed to investigate particular outbreaks and partly in the answers received in questions sent to municipal and shire officers and to local medical practitioners. Copies of these are given in the appendices.

In the 1925–26 epidemic the disease extended as far south as Newcastle, and, according to the reports of Dr. Paul, even as far as Gosford, on Brisbane Water, the northernmost portion of Broken Bay. Inland also the epidemic swept over a wide extent of country. Taking Gosford as the southernmost limit of the outbreak, the south-westerly boundry of the infected territory may be defined as that portion of the northern and north-western railway system which extends first northward to Werris Creek, then in a north and westerly direction to the terminus at Walgett, with an extension along the Darling to Brewarrina and Bourke, and thence to the Queensland border at Barringun, and with westerly extensions along branch lines to Denman and Merriwa from Muswellbrook, and to Binnaway from Werris Creek. The area included within this line, the Queensland border, and the sea was extensively infected, and may be defined as the 1925–26 dengue area. The northern line as far as Werris Creek runs more or less parallel to the main dividing range and then ascends the New England plateau. Here the elevation appears to have determined the absence of the disease since no cases are recorded from this area, which includes such towns as Walcha, Uralla, Armidale and Glen Innes, all of which lie above the 3,000 feet level. This altitude seems to be about the limit of breeding of the carrier, *A. ægypti* L., since towns at an elevation of 2,000 feet and less than 30 miles away—*e.g.*, Tamworth—were heavily infected and had an abundance of mosquitoes. It is, then, necessary to eliminate from the dengue area all that country which lies within the 3,000 feet contour line. The known distribution of the disease in New South Wales is shown in Map I.

The towns of the north-western slopes and plains seem to have borne the brunt of the outbreak, since, with the exception of the Tweed, Clarence and Hunter River districts, the disease was not heavy in the coastal area, though some cases occurred in most of the towns. In many, as at Taree and Kempsey, infection occurred towards the end of the breeding season of the mosquito and the epidemic did not reach nearly such proportions as in the extreme North Coast, the Hunter River district and the north-western division, where infection occurred earlier in the season when mosquito prevalence was at its height.

As might be expected, the greatest number of cases occurred in the towns, isolated farms and stations often escaping. As a general rule it was computed that whereas the incidence in a town might be as high as 90 per cent. of the population, that of the surrounding district was only 10 per cent., and that these were often infected on visits to the town. Such estimates are, of course, exceedingly rough, but nevertheless are in the main fairly accurate. It is of great interest to note that Kyogle, where some degree of mosquito control had been carried out, had only 10–15 per cent. of the population infected, as compared with 85–95 per cent. in neighbouring towns in which no control measures were in force.

Appended is a list of the towns where locally acquired infections are definitely known to have occurred :—

TABLE II.—LIST OF TOWNS KNOWN TO HAVE BEEN INFECTED DURING THE 1925-26 OUTBREAK IN NEW SOUTH WALES.

North Coastal District.

Tweed Heads.
Murwillumbah.
Byron Bay.
Alstonville.
Ballina.
Wardell.
Lismore.
Casino.
Kyogle.
Tabulam.
Drake.
Coraki.
Maclean.
Ulmarra.
Grafton.
Coff's Harbour.
Bellingen.
Bowraville.
Macksville.
Kempsey.
Wauchope.
Taree.
Wingham.
Bulladelah.
Port Stephens.

Hunter River District.

Newcastle.
Stockton.
Boolaroo.
Waratah.
Morpeth.
Maitland.
Greta.
Singleton.

Hunter River District—continued.

Muswellbrook.
Aberdeen.
Scone.
Murrurundi.
Quirindi.
Denman.
Merriwa.
Wyong.
Gosford.

North-western Slopes.

Werris Creek.
Tamworth.
Tenterfield.
Manilla.
Barraba.
Bundarra.
Inverell.
Ashford.

Western Division.

Binnaway.
Warialda.
Bingara.
Moree.
Gunnedah.
Boggabri.
Narrabri.
Wee Waa.
Walgett.
Collarindabri.
Brewarrina.
Bourke.
Barringun.
Hungerford, Queensland.

The limits of the dengue area have been outlined fairly closely above. The following towns bordering on the area failed to show evidence of infection either on direct inspection or on inquiry from the local authorities or practitioners.

TABLE III.—LIST OF TOWNS BORDERING ON THE INFECTED AREA AND KNOWN NOT TO HAVE BEEN INFECTED.

Coastal.

*Sydney.
Hawkesbury River.
Stroud.
Tuncurry.
?Comboyne.
Dorrigo.

New England Plateau.

Nundle,
Walcha.
Uralla.
Armidale.
Guyra.
Glen Innes.
Deepwater.

South-western.

Ryalstone.
Mudgee.
Gulgong.
Coolah.
Cobborah.
Mendooran.
Gilgandra.
Coonamble.
Orange.
Molong.
Wellington.
Dubbo.
Narromine.
Trangie.
Warren.
Nyngan.

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* mported cases; one case possibly of local infection from railway.

Period and Routes of Invasion.—The disease undoubtedly invaded New South Wales from Queensland, where an epidemic had been raging for some time previously. There is evidence that the invasion of New South Wales took place by more than one route and at more than one time. The Newcastle district was amongst the earliest infected, the first cases developing in November, 1925. The infection was brought direct from Queensland. The Upper Hunter Valley was infected later; not, however, from Newcastle, but by extension southward from Werris Creek or Murrurundi in February and March. In the North Coast, Tweed Heads and Murwillumbah were infected late in 1925, apparently by extension from south coastal Queensland. The disease did not reach epidemic proportions until early in 1926. By the end of February the epidemic was raging in many centres. Other places more isolated or more southerly were not infected until March, and in these the case incidence was much lower.

Inverell was infected fairly early (7th February, 1926) by travellers from Queensland, and served as a centre from which much of the surrounding country was infected. Some of the towns of the Main Northern line appear, however, to have been directly infected from Queensland. Tenterfield was infected both from Queensland and from Tamworth. The same holds good for the towns in the Western Plains—Bourke was infected from Cunnamulla in Queensland, but Brewarrina was infected from Bourke.

Speaking generally, in each of the main areas several towns were independently infected from Queensland, and served as separate centres for the spread of infection along the main traffic routes leading from them.

Distribution of Aedes (Stegomyia) ægypti L.—The great value of the work carried out in this laboratory by Cleland, Bradley, and McDonald in 1916 was the proof by direct experiment that *Aedes ægypti* L. is the vector of dengue fever. Subsequent investigations by Chandler and Rice and by the Phillipine Commission* have only tended to confirm these findings. This species was first incriminated by T. L. Bancroft in Brisbane, but his results were overlooked by subsequent investigators, or discounted in favour of the erroneous findings of Graham and of Ashburn and Craig. There is some reason to believe that another species may be responsible for transmission in Formosa, but direct experimental evidence is lacking.

Confusion yet exists in the nomenclature of this mosquito. For many years the "Dengue," "Yellow Fever," or "Tiger" mosquito was known by British entomologists as *Stegomyia fasciata* Fabricius, 1805, and by Americans as *S. calopus* Meigen, 1818. Both specific names were later discarded in favour of *argenteus* Poiret, 1787. Later, the Americans accepted *ægypti* Linné, 1762, as applying to this species. F. W. Edwards of the British Museum, while admitting the possible identity of the species with *ægypti* L., still employs the name *argenteus* Poir. as being more certain. In this he is followed by most British entomologists. The genus *Stegomyia* has also been reduced to subgeneric rank in the great genus *Aedes* since its characters are not generally considered sufficiently distinct to warrant full generic separation. Since much of the mosquito work in Queensland has been carried out by Americans in connection with the Hookworm Campaign, the name *Aedes ægypti* L. has been largely used in that State, and to avoid confusion I have thought it advisable to employ this name in the present paper.

TABLE IV.—RECORDS OF AEDES (STEGOMYIA) ÆGYPTI L. IN NEW SOUTH WALES.

A. Localities from which Definitely Identified Specimens have been received.

Coastal Districts.
Murwillumbah.
Byron Bay.
Ballina.
Lismore.
Casino.
Kyogle.
Tabulam.
Maclean.
Lawrence.
Grafton.
Newcastle.

North-western and Western Districts.
Inverell.
Delungra.
Moree.
Gunnedah.
Narrabri.
Pillaga.
Bourke.

B. Records based on Identifications by Local Medical Practitioners or Local Authorities.

Coraki.
Merriwa.
Tamworth.
Manilla.
Bundarra.
Boggabri.
Wee Waa.

Map II and Table IV show the distribution of *Aedes ægypti* L. in New South Wales as far as is at present known. Though the area has not yet been completely searched, and there are consequently fewer records of the mosquito than of the occurrence of dengue fever, it is apparent that this distribution corresponds closely with that of the 1926 outbreak, as shown in Map I. It is to be noted that the distribution of this mosquito given in most, if not all, text-books of tropical medicine is erroneous, since it includes portions of Southern Australia, where neither *Aedes ægypti* L. nor dengue are known to occur. Such records as from "the malarious districts of Victoria" are palpably incorrect. On the other hand, no distribution is shown for Western Australia, though the species was recorded by Cooling as very abundant at Derby and Broome, and extending as far south as Geraldton.

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[*] Siler, J. F., Hall, M. W., and Hitchens, A. P., 1926.—Dengue: Its history, Epidemiology, Mechanism of Transmission, Etiology, Clinical Manifestations, Immunity and Prevention. *Phillipine Jl. Sci,* xxix 1 and 2, 1-304.

A point that has recently been raised is whether the range of *Aedes ægypti* L. is extending, or has extended in recent years. In previous outbreaks dengue has been recorded only from the Northern Rivers, and the mosquito was thought to be confined to the coastal districts. It has, however, been known to occur at Newcastle for at least twenty years, and for some years at Narrabri and Pilliga. Its presence in other inland towns in New South Wales may have been overlooked, or may indicate a more recent extension of its range. In favour of the latter view is the fact that *A. ægypti* L. has been observed to extend to inland towns in Queensland and thence to the surrounding districts in recent years. This process of extension, the transport in all cases being supplied by human agency, takes some years to become apparent. On the other hand, it is quite feasible that the species has been present inland in New South Wales for years, but specimens have not been collected until recently. An extension to Sydney is unlikely in view of the fact that it must have been introduced countless times already, but has never been able to establish itself. This failure to become established in Sydney is probably partly a climatic limitation and partly due to the absence of suitable breeding grounds.

The close correspondence between the distribution of disease and carrier confirms in a remarkable degree that *Aedes ægypti* L. is the sole carrier of dengue fever in Australia.

INCUBATION PERIOD.

A. In Man.—The incubation period in man is estimated as from three to nine days, with one possible exception in Cleland's series, where the incubation was as long as fifteen days. From a study of the 1926 epidemic, it seems probable that in all cases the incubation was from three to seven days with a mean period of five days. In my own case these dates would appear to have been the extreme limits within which infection could possibly have taken place. Other cases known to me bear out this estimate.

B. In the Mosquito.—There is some confusion as to the period of development of the parasite in the mosquito and as to the duration of its infectivity. The terms are not synonymous. The experiment carried out by the Philippine Commission of Inquiry into Dengue concluded that a minimum period of eleven days was necessary after biting an infective patient before the mosquito became in turn infective. Cleland, Bradley, and McDonald obtained similar results with their infected mosquitoes. Chandler and Rice on the other hand found that mosquitoes were infective during the first three days after feeding, and this short period is in agreement with the epidemiological findings. It is difficult to explain the extreme rapidity of spread of dengue on a long incubation period (see Report of Bourke investigations, Appendix C.). It appears probable to me that there may be two periods of infectivity: (1) an early period of one to three days in which infection is due to contaminative inoculation, and (2) a true incubationary period in which infectivity follows on cyclical changes requiring not less than eleven days for their completion. The mosquito would appear to be non-infective from the third to the eleventh day. After eleven days, the mosquito remains infective for the rest of its life. It does not appear that the Philippine Commission tested infectivity under a period of seven days. More experimental work is required along these lines.

PERIOD OF INFECTIVITY IN MAN.

The human host is infective for one to three days after symptoms develop, dengue agreeing in this respect with yellow fever. No experimental work was carried out on this point during the 1926 epidemic, but it was determined in other epidemics, and the period agrees with epidemiological findings. Two days are probably the commonest period of infectivity in man.

SYMPTOMATOLOGY.

The symptoms of dengue are too well known to require detailed comment in a paper, which is after all, mainly a discussion from the epidemiological aspect, particularly since Cleland, Bradley and McDonald have already dealt extensively with the symptons both in the natural disease and that acquired by inoculation. Recapitulation will therefore be confined to such symptoms as were outstanding in the recent epidemic.

Rise of temperature was almost universally observed. The recurrent, or switchback type, was rather frequent, and characteristic of the disease, but was by no means invariable. The onset, except in rare cases, was sudden, with malaise and pains and aches, the rise of temperature preceding or postdating the onset. The course lasted a few days to a fortnight. Two phases were often present, but were not constant. Pains in the back and limbs and headache are present in the first phase; after some days the temperature falls, and there is a remission of the symptoms, followed after one to three days by recrudescence of temperature and symptoms.

The pains in the back, limbs, and joints are characteristic, as is the headache, which may be frontal, occipital, or all over the head. The pulse was comparatively slow, 70 to 100. The face was red, swollen, and puffy, but coryza was absent. Photophobia was sometimes present, associated with eye movements. Mental phenomena observed included giddiness, sleeplessness, mental irritability, delirium, and depression. Gastro-intestinal symptons were not marked. The tongue was dirty, resembling that seen in scarlet fever, and the fauces were reddened. Anorexia was a feature in most cases. Nausea and vomiting were common, though not as a rule marked. Diarrhœa or constipation were sometimes noted. Shivering occurred commonly, but definite rigors were exceptional. Leucopenia was the rule. Cardiac weakness, with fainting, occurred in one or two cases.

Preliminary and terminal rashes are well marked features of the disease, but apparently differ in different individuals and in different epidemics. Cleland, Bradley, and McDonald have illustrated the rashes, but the descriptions of various authors vary considerably. The prodromal rash is often stated to be punctiform and the terminal rash to be erythematous, urticarial, or pustular. Either or both rashes may be ephemeral, or apparently absent, or appear as a dull mottling under the skin. This was the case in most of the patients seen by me.

While the clinical picture varied a good deal, the symptoms practically universally present were remittent fever, pains in back and limbs, headache, and pains in the eyes, with a well marked remission.

MORTALITY.

The mortality is generally given as about 0·5 per cent., but is probably lower in uncomplicated cases. During the 1926 epidemic, twenty-nine deaths were registered as being due to dengue fever in New South Wales.

IMMUNITY.

Natural insusceptibility to dengue seems to be practically non-existant, if the very high epidemic rate (90-100 per cent.) in many centres can be taken as any indication. There has, however, been much discussion of the question of the development of immunity after an attack of the disease. In most cases such immunity is individual, and varying with the person. O'Brien, in Queensland, observed second attacks in persons who had been infected three years before, and suggested that it required this time for the immunity established at the previous attack to wear off. Siler and his co-workers in the Philippines indicate that some individuals must pass through more than one attack before acquiring a satisfactory immunity. It would appear on epidemiological grounds that any immunity acquired completely disappears within ten years after an epidemic, but that within a shorter period sufficient may persist to determine that a second epidemic will be mild in its effects and limited in its distribution.

While the individual immunity may be short and variable, the population as a whole develops sufficient mass immunity after an extensive epidemic to prevent the disease becoming re-established within a period of about ten years. This high mass effect of what is a relatively low-grade individual immunity is probably to be associated with the particular conditions of transmission of this disease, and possibly more particularly with the short period of infectivity of the patient. It is probably only effective in subtropical areas, such as New South Wales, where mosquito-breeding, and consequently the transmission of the disease, ceases during the colder months.

APPENDICES.

A. Medical Practitioners, Form of inquiry from.
B. Local Authorities, Form of inquiry from.
C. Reports of Departmental Officers—

Dr. E. W. Ferguson—
- Bourke:
- Inverell.
- Moree.
- Gunnedah.

Dr. H. G. Wallace—
- Murwillumbah.
- Kyogle.
- Lismore.
- Ballina.
- Casino.
- Tabulam.
- Tenterfield.

Dr. R. J. Millard—
- Walgett.
- Brewarrina.

MAPS.

I. Map of the Distribution of Dengue Fever and *Aedes ægypti* L. in the 1925–26 outbreak in New South Wales.

Appendix A.

Form of Inquiry from Medical Practitioners.

INFORMATION CONCERNING DENGUE FEVER.

Town of ....
Date when first case arose ....
Was disease introduced from elsewhere? .... If so, give date ....
Date when epidemic reached its apex ....
Total number of cases in town .... Total number of cases in district ....
Estimate percentage of residents attacked—
(*a*) town .... (*b*) district ....
The ages (in five-year periods) most subject to attack ....
The influence (if any) of sex ....
History of previous outbreaks (state year) ....
Prevalence of mosquitoes ....
Types of mosquitoes present in district ....
The period of incubation noted ....
Length of time occupied by—
(*a*) stage of invasion ....
(*b*) ,, remission ....
(*c*) ,, re-invasion ....
(*d*) ,, convalescence ....
Brief history of outstanding clinical signs (rash, &c.), or symptoms noted during the epidemic ....

Complications (if any) following the disease ....
History of second attack (other than the usual relapse) in the same individual ....

Number of deaths (if any) from Dengue fever ....
Symptomatic or other treatment found most useful ....

Remarks ....
(*Signed*) ....
(*Date*) ....

Appendix B.

Form of Inquiry from Local Authorities.

INFORMATION CONCERNING DENGUE FEVER.

Town of ....
Population of township .... Height above sea-level ....
Date when first case arose ....
Was disease introduced from elsewhere ? .... If so, give date ....
Date when epidemic reached its apex ....
Air temperature at that date .... Humidity at that date ....
Total number of cases in town .... Total number of cases in district ....
Estimated percentage of residents attacked—
(*a*) town .... (*b*) district ....
The ages (in 5-year periods) most subject to attack ....
The influence (if any) of sex ....
The influence (if any) of unhygienic conditions ....
History of previous outbreaks (state year) ....
Prevalence of mosquitoes ....
Facilities for their breeding ....
Types of mosquitoes present in district ....
Has Local Government Ordinance No. 41 been enforced prior to or since epidemic ? ....
Number of deaths (if any) from dengue fever ....
Remarks ....

(*Signed*) ....
(*Date*) ....

Appendix C.

Reports by Departmental Officers.

Dr. E. W. Ferguson: reports on Dengue Fever at Bourke, Inverell, Moree, and Gunnedah, in New South Wales, 1926.

A. *Bourke*—

I have to report that I visited Bourke on the 3rd–7th May, and made inquiries *re* the incidence of dengue in this town. Dr. Guiney informed me that the first case in the town was a bookmaker named Moxham who interviewed him on 31st January, 1926. Moxham had been at Cunnamulla races and had returned two-three days previously. He stated that he had been ill during this time, and had not been feeling well when he left Cunnamulla, so that he probably arrived at Bourke on the first or second day of the attack. He was admitted to Bourke Hospital on 1st February, 1926.

The second case seen was Mrs. Davis on 1st February, 1926. No connection was traceable between Moxham and Davis.

On 8th February, 1926, Mrs. Davis' daughter went down with dengue, and was seen on first day of illness.

On 9th February, 1926, Mrs. Davis' son developed dengue. Mr. Bradley, who lived in the same place as Moxham, developed dengue on 9th February, 1926. On 4th February, 1926, the proprietor of the Royal Hotel developed dengue, In this respect it may be noted that the races were held at Bourke on the first week in February and that Queensland visitors were staying at the various hotels, including the Royal.

On 5th February, 1926, two others at the Royal Hotel developed dengue, and on the 9th five others from the Royal. On 6th February, 1926, the dentist and a jockey developed dengue, and on 6th February, 1926, about thirty people were ill, including a number staying at Fitzgerald's Hotel. It is probable that the people at Fitzgerald's were infected from mosquitoes infected by Moxham, who used to frequent this hotel. Thereafter the epidemic became general. One case occurred about four-five days ago, and is now convalescent (4th May, 1926), while another occurred during my visit on 5th May, 1926. Enquiries were made regarding outlying stations and towns. It was found that several outlying stations had cases, but in most, if not in all cases, the patients were infected at Bourke.

The case of the Ridges might be instanced. These people live at Tuncoona, 40 miles north-west from Bourke, and off the main road. It is probable that they were in Bourke for the race meeting on 1st–2nd February, 1926. The first case came to town on 10th February, 1926, and was detained as having dengue.

A brother (Ridge 2) came in with the first case and was detained as suffering from dengue; he returned to Tuncoona in two days and came back to Bourke on 17th February, 1926, with dengue. Another brother (Ridge 3), who drove the brothers into Bourke on the two occasions, developed dengue and came in to hospital on 27th February, 1926.

Mrs. Ridge was away in Sydney at the time, but returned subsequently and then developed dengue; it is not known whether she was infected in Bourke or at Tuncoona.

At Curranyalpa four cases occurred; this place is on the river nearer Wilcannia. All four cases were apparently infected in Bourke. It is unknown whether other cases occurred at this town.

At Beemery, 33 miles from Bourke on the way to Brewarrina, dengue occurred at the end of February, 1926.

Dengue occurred at Brewarrina in the beginning of March.

Barringun apparently had cases, but extent of disease there is not known.

Hungerford, one case known, probably infected at Bourke.

Wanaaring, no cases.

Tilpa, one case, the police constable, infected at Bourke.

The sequence of cases at Bourke suggests that the statement made by Siler and his fellow workers that the mosquito is not infective until 11 days after biting an infected person, is not correct. Mrs. Davis was ill on 1st February, 1926; at most she was in the second day of the attack; Mrs. Davis's daughter, seen on 8th February, 1926, was in the first day; allowing a minimum of three days incubation period in the patient, this would give an incubation period of at most four days in the mosquito, and if the incubation period in the patient be lengthened, the incubation period in the mosquito must be shortened.

As the source of Mrs. Davis's infection is unknown, there is a remote possibility that her daughter may have been infected by the same mosquitoes—but seven days later.

In the Ridges' case it is probable that all three brothers were infected on successive visits to Bourke, and this throws no light on the minimal period of infectivity in the mosquito.

Bradley was practically certainly infected from mosquitoes infected by Moxham, a period of eleven days elapsing between the onset of the cases. This is also against the Americans' statement, since several days (at least three, and probably nearer seven) must be allowed for the incubation period in the patient. The sudden access of cases on 6th February, 1926, about eight-nine days after Moxham's return is also in keeping with the above.

Mosquitoes at Bourke.—Four species of mosquito were identified at Bourke :—*Aedes* (*Stegomyia*) *argenteus* Poiret, (*Aedes ægypti L. teste* American authors)=*Stegomyia fasciata*; *Ades* (*Ochlerotatus*) *theobaldi*, Taylor; *Aedes* (*Ochlerotatus*) *sagax*, Skuse; *Culex fatigans*, Wied (*Culex quinque fasciatus* say, *teste* American authors).

Adults of *Stegomyia* were found at the Central Australian Hotel, at Fitzgerald's Hotel and at the local hospital.

Culex fatigans was abundant everywhere, especially at the hospital.

The other two species are bush mosquitoes and of no significance.

Breeding Grounds.—Bourke has a municipal water supply which is pumped up from the river into a high tank and thence distributed throughout the reticulations. The water is turbid and except among the poor classes is not used for drinking purposes. Rainwater tanks are used at the hotels and better class houses for collecting drinking water. These tanks are of the usual cylindrical galvanised iron type with perforated cover. In no case was the tank rendered mosquito proof by wire meshing. While no larvæ were actually seen in a tank, *Stegomyia* larvæ were present in the water jug on the table at the Central Australian Hotel, and this water was derived from a rainwater tank.

Breeding was proceeding in the dishes above and below a dripwater tank at Fitzgerald's Hotel, the larvæ being mainly *Stegomyia*. Other places where *Stegomyia* was breeding were the ant pots at foot of a meat safe in the yard at the Central Australian Hotel and in the fire buckets at the station. *Culex fatigans* was found breeding in the sullage water pit at the hospital, in two horse troughs, in a water bag at the hospital, in the fire buckets at the station, in the ant pots at the Central Australian Hotel, in an empty bucket in a disused privy, and in open tanks at Kessey's Hotel. It is certain that a more exhaustive search would have revealed many more breeding places, but sufficient were found to demonstrate that the conditions for the breeding of *Stegomyia* were present and that such breeding was actually taking place.

INVERELL, MOREE, AND GUNNEDAH.
(PAPERS 26/31870.)

B. Inverell.

In accordance with instructions I visited Inverell on 4th March. On arrival I called at the Municipal Chambers and saw the Health Inspector (Mr. Roberts) who placed himself at my disposal, and with him I visited various portions of the town and surroundings.

Inverell is a town of about 5,000 inhabitants, situated on the banks of the Macintyre River; across the river from the main town is Ross Hill—a residential suburb. The river is dammed by a weir at the town, and below the weir is largely a dry bed containing waterholes of varying length. There is no municipal water supply, though efforts are at present being made to put down a bore at the power house, the bore is down about 250 feet, but a sufficient supply has not yet been struck. For water the town depends on the individual rain water tanks.

Breeding Grounds.—The possible breeding grounds for mosquitoes may be classified under three headings (1) River pools, (2) Tanks, (3) Odd collections of water.

(1) River Pools.—Several pools were examined in the bed of the Macintyre River beyond the weir. Around the edges a few larvæ of *Anopheles annulipes* and *Culex* sp ? (probably *C. annulirostris*) were found. No evidence of the presence of *Aedes* (*Stegomyia*) *argenteus* (*Stegomyia fasciata*) was found.

(2) Tanks.—All premises both in the town and in the suburbs possessed galvanised iron tanks. They were of different capacity, but almost universally cylindrical in shape, with flat top containing a round opening to receive the rain water and an overflow pipe at top. The opening was generally fitted with a perforated depressed galvanised iron strainer, in some cases protected by wire gauze, in most cases without the gauze. The overflow pipe was generally uncovered, though in some cases protected by wire gauze. Instances were found where the top of the tank was broken or where the strainer was missing.

Many of the tanks had been protected further by the addition of a covering of kerosene or liquid paraffin, but in a few instances mosquito larvæ were found in tanks, apparently both *C. fatigans* and *Aedes argenteus* were represented.

(3) Odd Collections of Water.—In one or two instances odd collections of water were found about dwellings. These include horse troughs, old kerosene tins, disused tanks, trays under drip safes, &c. Breeding was found in one horse trough in the centre of the town, the species present being apparently mainly *C. fatigans;* in other instances breeding was found in old kerosene tins and from one of these *Aedes argenteus* was obtained.

In most cases the larvæ collected have not yet emerged, but one pupa yielded a male of *A. argenteus* and several *Culex fatigans* have emerged.

Adult Mosquitoes.—These could not be described as abundant, but *C. fatigans* was noted in the hotel, and I was bitten by at least two *Aedes argenteus* when talking to the Town Clerk in the Municipal buildings. I was informed, however, that mosquitoes had been unduly prevalent, and the active measures already put in force have probably done much to limit the numbers of adults.

Dengue Fever.—I was informed that dengue fever had been present in Inverell for about four weeks, and that at least two-thirds of the town had been infected. Dr. Stuckey was of opinion that the epidemic was abating somewhat, though new cases were still developing.

From what I was told by Dr. Stuckey and by the patients seen by myself, there can be no doubt that the disease is typical dengue fever. The headache, pain in eyes, flushed face, pain in back, joints, the remission and the rash were all present and characteristic.

Means of Spread.—The carrier of dengue fever was shown to be *Aedes argenteus* (*Stegomyia fasciata*) by Cleland, Bradley, and McDonald in 1916. The presence of this mosquito therefore is necessary before the disease can be propagated in a community. The only source of doubt is whether other species of mosquito may not be able also to convey the disease. The evidence in Australia suggests that *Aedes argenteus* is alone responsible. As noted above this mosquito is present in Inverell and is breeding in the vicinity of houses.

Preventive Measures.—I found that precautions had already been taken by the Municipal Council and operations were in train to eliminate the mosquito.

Householders had already been warned of the necessity of preventing mosquito breeding and the provisions of Ordinance 41 had been put in force.

The public had been advised that all water tanks, horse troughs, &c., must be covered with kerosene or paraffin, and that all refuse be removed from the premises at least once a week.

The kerosening of tanks was insisted upon for the reason that the covering of tanks with wire mesh throughout the town would take a considerable time and furthermore that the workmanship could not be depended upon. While therefore the local authority is requiring that tanks be efficiently protected by wire mesh, it is at the same time insisting on the use of paraffin or kerosene.

Paraffin is advocated as it imparts no taste to the water, as in the case of some brands of kerosene. It has the disadvantage of not forming a good film on the surface.

Few people are, however, objecting to the taste of the kerosene. To ensure compliance with the ordinance the Health Inspector has been given assistance, and a house to house inspection is to be instituted at once, and it is proposed to prosecute any householder or occupier upon whose premises mosquito breeding is taking place.

To facilitate the removal of rubbish, the fortnightly garbage service has been converted into a weekly service.

The pools in the river bed are being oiled regularly, though I do not consider that these constitute a breeding ground for *Aedes argenteus.*

C. Moree.

From Inverell I proceeded to Moree by train, arriving there at 2 p.m. on 5th March. On arrival I interviewed the Town Clerk (Mr. Thomson) and he arranged that the Health Inspector (Mr. Maidens) should accompany me on a search for breeding places.

Moree is a town of about 3,500 inhabitants, situated on the banks of a branch of the Gwydir, known as the Meei, which was probably the original channel of the river. About three miles to the north is the main channel of the Gwydir, generally known locally as the Big River. Connecting the two and traversing the town obliquely is the Broadwater, a dry channel which fills with a rise in the river and then runs as a rule back from the Big River into the Meei. The bed of the Meei is dry except for rapidly drying waterholes.

Water Supply.—The town is supplied from a bore situated in the town at the back of the Council Chambers. Most of the residences, the hotels, and many business places also possess rainwater tanks for drinking purposes.

Breeding Areas.—*Tanks.*—These were of the same pattern as at Inverell, but many were completely dry, and had been so for some time. Other were protected by wire mesh, but the majority had only a perforated galvanised cover or even no cover at all. Mosquito breeding—*Culex fatigans* and *Aedes argenteus* were found in several tanks, both in the business portion in East Moree, which lies to the east of the Meei, and in Frog Hollow—a low-lying locality near the Broadwater.

Horse Troughs.—Breeding, mainly *C. fatigans*, was found in a horse trough in the yard of the Hotel Victoria near the station. The water tanks in the same premises also contained mosquito larvæ.

Odd Collections of Water.—Breeding was found to be taking place in four vessels of water in which a meat safe was standing in the Hotel Victoria. Pupal and larval cases were found in one instance in the tray beneath a drip safe.

Waterholes.—Several waterholes were investigated in the bed of the Meei, and larvæ of *Culex annulirostris* and *Anopheles annulipes* obtained. No evidence of *Aedes argenteus* was found.

A waterhole behind the power house which collected overflow water from the bore was found to be so mixed with oil that no larvæ could be expected to breed in it.

In addition to the bore supplying the water to the town there is the bore which supplies the water to the Bore Baths. This is discharged into a channel on the south and east of the town and eventually into the Meei. The banks of this channel are in many places trampled and hoof marks filled with water are present. No mosquito breeding was found either in the main channel or in the hoof marks, probably on account of the water being highly mineralised.

Adult Mosquitoes.—Both *Culex fatigans* and *Aedes argenteus* were taken in rooms in the town, but neither in great numbers, probably the number of dry tanks has lessened the breeding.

Dengue Fever.—This disease made its appearance in the town about a week before my arrival. Dr. Parry informed me that he had seen over 60 cases, probably an equal number had been attended by Dr. Hunter, and as many more had not called in a doctor. On a conservative estimate at least 150 cases must have occurred, and the epidemic must be regarded as only commencing.

In company with Dr. Parry I examined a number of the cases who presented the classical symptoms of dengue fever

The first case appears to have occurred at the Hotel Victoria opposite the railway station, from whence it spread to adjacent premises and thence to the town generally.

Preventive Measures.—The Town Clerk was interviewed both before and after my inspection of breeding holes and a plan of campaign outlined. Ordinance 41 has been proclaimed in Moree Municipality, and the provisions of the ordinance are to be put in force and householders compelled to rid their places of mosquito breeding. As a first step a house to house visitation is to be instituted, and all tanks which are not properly protected by wire gauze are to be treated on the spot with kerosene. The owners or occupiers are also to be required to adequately protect their tanks.

Horse troughs and other collections of water are to be attended to and rubbish removed. By these measures it is hoped to limit the outbreak.

I may state that both at Inverell and Moree I had the cordial co-operation of the Council who agreed to undertake any measures suggested. I was also greatly helped in each town by the Health Inspectors—Mr. Roberts at Inverell, and Mr. Maidens at Moree.

D. *Gunnedah.*

On the return journey I met a police officer on the platform at Gunnedah. He informed me that dengue was rife in Gunnedah, and that he had been one of the first cases to be attacked.

He complained principally of the condition of the septic tank at the Royal Hotel where he stated that extensive breeding was taking place in the effluent. He also complained of the offensive odours arising from this tank.

Reports by Dr. H. G. Wallace on Dengue Fever in North Coast towns in New South Wales, 1926.

(Papers 26/31518.)

A. *Murwillumbah.*

I have to report that on 27th April, 1926, as instructed, I visited Murwillumbah, and made enquiry into the recent outbreak of dengue fever in the town, interviewing the Mayor, the deputy Town Clerk, the engineer and several of the local medical practitioners.

Description.—Murwillumbah is a town of over 4,000 inhabitants, situated on the Tweed River, about 20 miles from the mouth. The town is situated partly on hills and partly on flat land on both sides of the river, approximately three-fourths of the houses being situated on sloping land. The rainfall is about 72 inches per annum, and the drainage from the hills is partly conveyed to the river and partly to several areas of swampy land within and just outside the municipal boundary. Thus there are shallow swamps on the north-east, north-west, and west of the town. These swamps, I am informed, are under the control of a drainage trust, and drains are constructed in several places to carry the water, and especially storm-waters, to the river. In spite of this, there are several acres of swampy land, with drains containing a thick growth of weed and stagnant water, within the municipality.

In addition to these, the River Tweed runs through the town, its banks being reedy, and a creek runs through the southern portion of the town. A second blind creek in the north-eastern portion is partly filled in, and the channel is partly occupied by a concrete drain, which is, in part, an open sewer conveying sullage waters.

The street gutters are not all formed, and in places are grass-grown and contain stagnant water.

I am informed that the formed street channels are flushed weekly with a strong solution of phenol disinfectant.

Dengue Fever in Murwillumbah.—The town has suffered from outbreaks of dengue fever in 1911, 1916, and this year. It is estimated that during the 1926 epidemic, which has subsided during the past fortnight, over 90 per cent. of the population has suffered from the disease.

History of the 1925–1926 *Outbreak.*—The first known case of the disease in 1925 was a patient of Dr. J. McEvoy's, who gave birth to a child on 10th September, 1925, and on 13th September, 1925, developed a typical attack of dengue fever, with rise of temperature for three days, a remission for 36 hours, and a further rise to 104 deg. for two days, accompanied by a rash, and terminating by crisis.

The patient lived on the Condong Range, and had had no contact, so far as is known, with any previous case.

The second known case, Mrs. S., was diagnosed by Dr. Goldsmid on 29th November, 1925. This patient had had a high temperature for over a week, and the diagnosis was in doubt until a rash appeared, which was regarded as typical of dengue fever. Since that time other cases have been occurring until last week. Between 3,000 and 4,000 cases have occurred.

In most cases the course of the disease has been quite typical, and in accordance with text-book descriptions. Both infants a few days old and old people have suffered. It is doubtful whether any deaths have been directly attributable to the disease. One patient of Dr. Goldsmid developed, three weeks after the typical attack, a numbness of the fingers followed by dysphagia and symptoms of acute bulbar paralysis, death ensuing in six days.

Another patient, with a familial history of Raynaud's disease, developed acute pain in the hands; on examination both radial and brachial pulse were indistinguishable, and death followed in a few hours from sudden heart failure. It is very doubtful whether death was in any way attributable to dengue fever.

The cases on the whole have been mild. They may be classified under three heads :—

1. Cases of a rheumatic nature with symptoms referred to the joints, mainly knee, ankle, and fingers.
2. Cases in which the digestive system was chiefly affected—with vomiting, anorexia, or diarrhœa.
3. Cases in which nervous symptoms predominated—sleeplessness, restlessness, nervous irritability or depression.

Epistaxis was a common feature.

One true petechial rash was seen. In others false petechiæ, fading on pressure, were seen. Metrorrhagia and especially menorrhagia were not uncommon symptoms in adult females. Early congestion of the fauces with irritable cough lasting one-two days was so constant as to be of diagnostic importance. Second attacks were said by one observer to be common. Others denied this. Possibly influenza was in some cases wrongly diagnosed as dengue.

Origin of the Outbreak.—Very little light could be thrown on this. The disease was probably brought down from Queensland by travellers, or possibly by infected mosquitoes on coastal boats.

Mosquitoes in Murwillumbah.—Aedes argenteus (*ægypti*) was found throughout the township biting freely through the day, and even up to 7.30 p.m., nearly two hours after sundown. The only species seen by me were *Aedes argenteus, Culex fatigans* and *Mucidus alternans.* The two former were plentiful, but of the latter only one specimen was seen. Specimens were taken, and kept for identification.

The chief breeding places of the two former are undoubtedly the unprotected rain-water tanks which are present on almost all premises. The latter breeds probably in the swamps above referred to, but not in large numbers. A weekly and bi-weekly garbage service removes old tins and bottles, &c. Plenty of shelter is provided by plants and creepers grown close to a large number of the houses.

Action taken by Council.—Although Ordinance No. 41 has been applied to Murwillumbah since originally gazetted no effective action has yet been taken to enforce it. Early in February, 1926, the Council by a notice in the local papers requested householders to attend to their tanks.

There is no full time Health Inspector, the engineer carrying out the duties of Health Inspector in such time as can be spared from his other duties. In February he made an inspection of several premises and found the tanks to be unprotected. A man was deputed to make a house-to-house visit for the purpose of putting kerosene on tanks, but this work was soon allowed to lapse again.

The Council desires advice as to the prevention of future outbreaks. In my opinion there is only one means of prevention—abolishing *Aedes argenteus.*

In my opinion in a town the size of Murwillumbah, the council should employ a certificated Health Inspector. A house-to-house inspection as required by the "Public Health Act, 1902, Section 57" should be made, and details of mosquito breeding places on premises noted. Energetic action should then be taken to enforce the provisions of Ordinance No. 41. Corrugated galvanized iron tanks are almost universally used. The Council might purchase gauzed fittings of a standard type, as used in Newcastle or Kyogle, at a wholesale rate and re-sell to householders cheaply. The cost per tank at Kyogle was 15s.

Drains and gutters on council property should be cleansed of weeds and oiled with a spray, as well as the creeks. The Drainage Trust should be requested to keep their drains oiled and free from weeds. Defective street guttering should be replaced by concrete kerb and guttering as far as possible.

It may be anticipated that, owing to the almost universal infection of the population in 1926, and the consequent immunity developed, a recrudescence of the disease should not occur for a period of, say, five years.

A comprehensive 5-years programme should therefore be laid down by the Council, with the object of eradicating *Aedes argenteus* from the township within that time. A few prosecutions under Ordinance No. 41 would probably have a marked educative effect on the townspeople. A pamphlet setting forth the council's aims and programme might be distributed to rate-payers with the rate notices. The essential for success is thoroughness.

Summary.—1. The third outbreak of dengue fever in Murwillumbah extended from September, 1925, to April, 1926, affecting persons of all ages. Few, if any, deaths were directly attributable to the disease, which in general was of a mild type. The origin of the disease was probably in Queensland.

2. *Aedes argenteus*, the mosquito vector of dengue, is common throughout Murwillumbah. Breeding places are chiefly unprotected tanks, neglected drains and creeks may contribute.

3. There appears to be need for a certificated Health Inspector in Murwillumbah.

4. Prevention of future outbreaks can best be secured by an organized campaign against *Aedes argenteus*, spread over the next four or five years.

Recommendation.—It is submitted that the Council of the Municipality of Murwillumbah might be written to in terms of the above, stressing the importance of—

1. Thoroughness in abolishing all likely breeding places, and
2. Complete organising of the campaign, including the education of the citizens, with a view to securing their intelligent co-operation.

Kyogle.

(Papers 26/31519.)

I have to report that on the 30th April, 1926, as instructed, I visited Kyogle in connection with the recent dengue fever epidemic, and interviewed the Shire Clerk, Government Medical Officer, and others.

Kyogle is an urban area with a population of about 1,500 persons, the terminus of a branch railway from Casino, 20 miles distant.

The town is almost entirely situated on a well-drained slope, but there is a lagoon within the area. The rainfall varies from 30 to 80 inches per annum. There is a weekly garbage removal service, the depôt being about 2 miles distant. Tank water only is used. Ordinance 41 was applied to the area in 1920, and in 1923 steps were taken to enforce it. The council, by contract with two local plumbers, arranged for all the tanks in the area (between 300 and 400) to be effectively screened against mosquitoes. The cost per tank was about 15s., and this amount was recovered from the ratepayers. At the same time the Health Inspector and an assistant arranged to keep all drains clear of weeds and to spray a lagoon near the township. Mosquitoes at the beginning of 1923 were a plague, but in 1924 their numbers had been so much diminished that for the past two years no mosquito nets have been used in the town.

Dengue fever was very prevalent in 1916. The first case of dengue fever in Kyogle in the 1926 epidemic was seen by Dr. Lewis on the 28th February, 1926. This patient had contracted the disease in Brisbane. After an interval of three or four weeks other cases occurred. It is estimated by Dr. Lewis and by Dr. Jones, Government Medical Officer, that 10–15 per cent. of the population have been affected. This is a marked contrast to the experience in neighbouring towns such as Casino and Lismore, where 85–95 per cent. of the population have suffered from the disease.

Undoubtedly in many cases the disease was contracted outside the area, and it is possible that infected mosquitoes have been brought in by trains and other vehicles from Casino, where they are plentiful. The Government Medical Officer, Dr. Jones, informed me that the disease was practically absent from premises where strict anti-mosquito measures were taken. The type of the disease has been mild. A few cases have been associated with jaundice. No deaths have been attributed to dengue fever.

While at Kyogle I observed that most of the tanks seen were efficiently screened. The following, however, were also observed in a very few cases:—

1. Unprotected outlets to tanks;
2. Sagging roof gutters;
3. Grass-grown gutters;
4. Long grass containing broken bottles, &c.,

and specimens of *Aedes argenteus* were captured in the town.

It appears from this that anti-mosquito work in Kyogle is not as thoroughly carried out as it might be. Nevertheless, mosquitoes are comparatively rare, and, at any rate, partial success has followed the precautions taken.

Summary.—Anti-mosquito work has been carried out, though not thoroughly, in Kyogle since 1923. There are very few mosquitoes in the area. Dengue fever occurred in 1916, and again this year, the first case occurring on the 28th February, 1926. There has been approximately one-tenth the incidence of dengue fever in Kyogle as compared with neighbouring towns.

Dengue Fever Outbreak, North Coast of New South Wales.

(Papers 26/31902.)

I have to report that after visiting Kyogle on the 30th April, 1926, I made further inquiries into the recent dengue fever outbreak at Lismore, Ballina, Casino, Tabulam and Tenterfield.

Lismore.—The first case noticed in Lismore occurred early in January, 1926. This was followed shortly afterwards by other cases. The disease is considered to have been brought by visitors from Queensland. Over 90 per cent. of the population has been affected. A few cases are still occurring daily. The disease has almost universally been mild in type. There have been several cases complicated by appendicitis, which may have been due to a gastro-intestinal type of the disease. There have been no deaths attributable directly to dengue fever. All ages have been affected.

Aedes argenteus plentiful. Specimens captured for identification.

Ballina.—Visited on the 2nd May, 1926. Dr. Yates, Government Medical Officer, interviewed. Many mild cases have occurred here. Perhaps 50 per cent. of population affected. No serious case. No deaths.

Aedes argenteus seen, but not plentiful. Cases occurred during March and April. Few cases still occurring.

Casino.—First cases in February. Over 90 per cent. of population affected.

Aedes argenteus plentiful. No serious cases. No deaths.

Tabulam.—First case occurred in March. One hundred per cent. of population affected.

Aedes argenteus was not seen here, but mosquitoes are said to be bad in the evening. No serious cases.

Tenterfield.—Visited on the 3rd May, 1926. Dr. Watt, Government Medical Officer, interviewed. First case occurred about the middle of March, imported from Brisbane. Other cases followed soon after who had contracted the disease in Inverell. Unable to say what proportion of the population was affected, but probably less than half.

No *Aedes argenteus* found during a few hours' stay. No serious cases; no deaths. Few cases still occurring.

Dengue Fever, Newcastle District.

On 12th February, 1926, a medical practitioner at Stockton reported the presence of several cases of fever with an unusual rash. The possibility of its being some form of mild endemic typhus was excluded by the absence of the Weil-Felix reaction in the first few cases seen, and the provisional diagnosis of dengue fever was soon confirmed. Further investigation showed that similar cases had been occurring in a limited area for some weeks previously, and a few days later newspaper reports of the presence of the disease at Coraki and other places on the North Coast of New South Wales came to hand. A sharp increase in the number of cases in Stockton occurred towards the end of February and lasted until April, several hunderd persons being affected within a small area, the exact number being uncertain owing to the fact that the disease is not notifiable in New South Wales. Sporadic outbreaks occurred in the suburbs on the south side of the harbour during the next six or seven weeks. In each case precautions were taken to fumigate the house, and to have all houses within a radius of about a hundred yards visited by the Health Inspector and the occupants advised to employ insecticide sprays, and screen tanks and attend to possible breeding-places of *Aedes ægypti.* Possibly on account of this, no further extensive outbreaks occurred in Newcastle. Outbreaks occurred in Singleton, Cessnock, Maitland, and other towns in the district either at this time or later in the year.

The origin of the Stockton outbreak could not be definitely settled, but inquiry showed that probably the first cases occurred as early as the end of November, 1925, in the vicinity of a shipbuilding yard, where several boats trading to the Northern rivers had been on the slip about this time. *Aedes ægypti* was plentiful in the vicinity and the outbreak probably originated from this focus. The first cases were variously diagnosed as measles, scarlet fever, influenza, and even typhoid fever.

The symptoms of the disease were fairly constant, onset with feelings of chilliness, occasionally definite rigor, often marked dizziness, headache (frontal or over vertex) pain in eyeballs, especially felt on moving the eyes, backache, felt most in the small of the back, occasionally vomiting or diarrhœa, tongue very thickly coated with white fur, anorexia, sharp rise of temperature to 101 deg. or higher. The rashes varied considerably in appearance and situation. In some cases carefully observed the rash was entirely absent. Joint swellings, quickly subsiding, were observed in a few cases.

The course of the disease was usually short and no deaths were reported. The debility and anorexia during convalescence, however, in many cases lasted for weeks.

Prevention.—With one exception, all the municipalities in Newcastle and suburbs had adopted Ordinance No. 41 under the Local Government Act, 1919, by the end of the year. This gives the council power to enforce the suppression of breeding of mosquitoes on householders' premises. A " Mosquito Week " was held in Newcastle and suburbs during the year, and by means of window displays, posters, cinematograph films, and newspaper articles publicity was given to the eradication of *Aedes ægypti.*

Report by Dr. R. J. Millard on Dengue Fever in Western Towns in New South Wales, 1926.

(Papers 26/28879).

In accordance with your instructions I left Sydney on the 16th instant and visited the following towns :—Walgett, on 17th and 18th March; Brewarrina, on 19th March; Nyngan and Warren, on 20th March; Trangie, Narromine and Dubbo, on 21st March; Wellington and Orange, on 22nd March.

At these places I found the conditions as follows :—

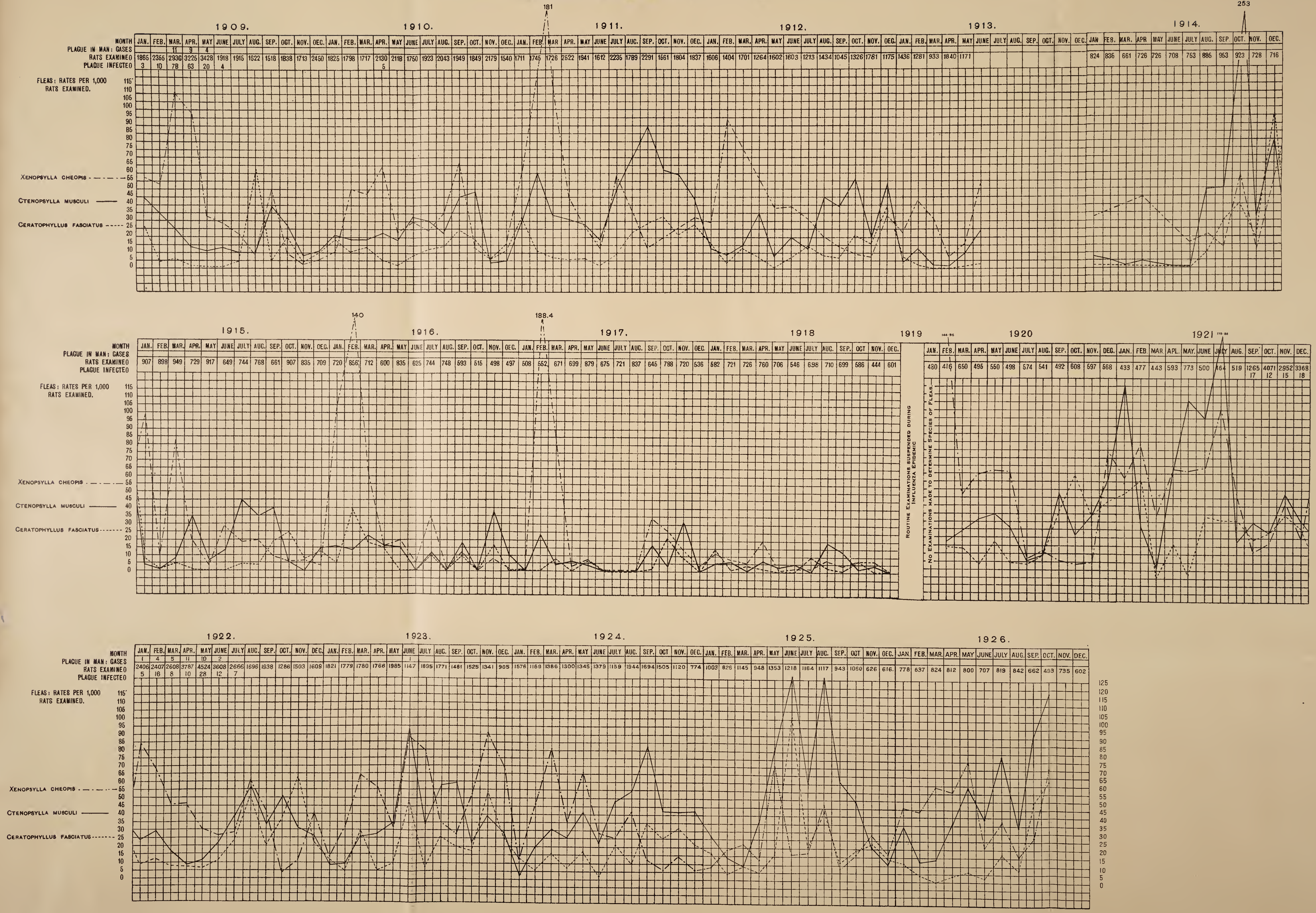
Walgett.—Dr. Schwartz, who is the only medical practitioner in Walgett, had gone away on 13th March for a holiday. I saw his *locum tenens,* Dr. Mayne. He said he had seen twelve cases of dengue fever since his arrival, and that there had been a good many other cases in the town.

Mosquitoes are numerous and are breeding freely in the " coolers," of which nearly every house has one. These are food safes with a tray of water above and below, and an arrangement by which water drips from the upper to the lower tray. I saw the Shire Clerk, and also the Editor of the Walgett newspaper. The latter undertook to publish excerpts from the departmental mosquito pamphlet, and to urge the public to take active measures against the mosquitoes, in the dwellings especially.

Brewarrina.—Dr. Hales is the only practitioner. He has had only a few cases of dengue fever, the first of which he saw on 14th February. As this is more than a month ago, one may hope that there is not going to be an epidemic in Brewarrina. Here, as in Walgett, there are many mosquitoes, and the domestic water-cooled safe is a prolific breeding ground.

At the other towns visited by me I made enquiries of the medical practitioners, but at none of them had there been any cases of dengue fever other than occasional imported cases.

Chart designed to show Seasonal Prevalence of the three principal species of Fleas found on Rats examined in the Microbiological Laboratory each year from 1909 to 1926 inclusive.



* Lines not Completed for the Second Half-year, 1913.

Examination of Rats was suspended from July to December, 1913, owing to the Smallpox outbreak.

6. THE MOSQUITOES OF THE SYDNEY DISTRICT.*

(I. M. Mackerras).

Owing to the proximity of the Sydney district to areas in which mosquito-borne diseases are of serious importance, and owing to the fact that the question of control has been exercising the minds of many citizens of Sydney in recent times, it seems desirable that accurate information about the various local species should be more widely available than it is at present. An endeavour has been made in this paper to present the important facts in a concise manner and to indicate their relation to the question of control. The conclusions reached, it is believed, are amply justified by the facts.

The area under consideration may be taken as extending from National Park in the south to the Hawkesbury River in the north and westwards as far as the eastern slopes of the Blue Mountains. It includes many different environments, of which the most important from the present point of view are—the Wianamatta shale country with its small forests of straight trees; the heathy flat sandstone tops; the more densely wooded sandstone slopes; the deeply dissected sandstone gullies; rich patches of brush country on the Narrabeen shales; flat, marshy area of Pleistocene sand; mud flats, usually with mangroves; the sublittoral sandstone region; finally, but not the least important, the habitations of man. Some species range over a considerable variety of environments, others are extremely limited. Some of the types of country are not markedly dissimilar, for example, the Wianamatta forests and the more densely wooded sandstone slopes have sufficient factors in common to share certain species of mosquito. On the other hand, the heath fauna is different from that of the gullies and much poorer in species. The peculiarities of each species are dealt with below.

Twenty-nine valid species are at present recognised for the Sydney district, a fair share of the 98 recorded for the mainland, plus Tasmania. It is highly probable that a few names still remain to be sunk as varieties, or possible as synonyms. and there are a few other unidentified species awaiting description. The bulk of the local mosquito fauna, 12 species, are southward extensions of more northern species, while three are southern forms and the remainder either local or widespread.

Notes on Species.

Anopheles annulipes Walker.—An ornate brown species speckled with white. It is widespread in the area throughout the warmer months, but is rarely seen in houses. It is usually present in small numbers in the sandstone gullies, but is most abundant in the low marshy country at Narrabeen. The larvae are found in small swamps, in soakage pools, in small numbers in rock pools, and sometimes in running water; it only breeds in clear, fresh water and prefers situations containing an abundance of green aquatic vegetation. It bites usually at dusk and at night, but occasionally also during the daytime. This species is the presumed transmitter of the sporadic cases of malaria that have occurred in the district.

Anopheles atratipes Skuse.—An uncommon black species. It is found in late spring in well sheltered gullies and the vicinity of creeks running through the Pleistocene sand flats. It is a day biter and appears to be of no sanitary importance.

Anopheles stigmaticus Skuse.—A rare, small brown species which looks, when alive, like a *Culex.* It is only known, so far, in the district from the rich Narrabeen shales at Waterfall in National Park. Larvæ have been found in rock holes in creeks.

Megarhinus speciosus Skuse.—A useful species which was recorded from Near Sydney by Skuse, but which has only once been seen since in the area (Gundamaian, National Park, T. G. Campbell). A tree hole breeder.

Rachionotomyia atripes Skuse.—Not common in the district. It may be taken biting by day in the more heavily timbered areas on the Wianamatta shale and the sandstone slopes. Principally a tree hole breeder.

Rachionotomyia tasmaniensis Strickland.—An allied but rarer species which is only known in the area from the Narrabeen series at Waterfall in National Park.

Aedomyia venustipes Skuse.—The type, which was taken in the eighties at Elizabeth Bay, remains unique. Larvæ, presumably of this species have since been taken in National Park.

Taeniorhynchus linealis Skuse.—A rare, day biting species which is found in sandstone gullies.

Mucidus alternans Westwood.—A very large species which usually bites in the evening. It may be very plentiful and annoying during the summer anywhere in the vicinity of mud flats. Principally a salt water breeder, this species is commonest in the Hawkesbury River, upper reaches of Middle Harbour and the Parramatta River, and in National Park. The larvae are predators.

Aedes (*Ochlerotatus*) *vittiger* Skuse.—A sandstone gully species which is rarely common.

Aedes (*Ochlerotatus*) *flavifrons* Skuse.—A spring species which bites by day and is found in the sandstone gullies. A southern form.

Aedes (*Ochlerotatus*) *camptorhynchus* Thomson.—An uncommon spring species which bites by day in the sandstone heath country. It is a southern form which corresponds in Melbourne in importance to *A.* (*O.*) *vigilax* Sk. in Sydney.

Aedes (*Ochlerotatus*) *rubrithorax* Macquart.—An uncommon species which has been recorded from Sydney and the Hawkesbury River.

Aedes (*Ochlerotatus*) *vigilax* Skuse.—An exceedingly abundant and annoying blackish species with white tarsal bands. It is prevalent throughout the warmer months and bites principally by day, but also continues its operations during the night. It occurs on all types of country and frequently enters houses, but is most abundant and annoying in the garden and in the bush. Its density varies inversely with its distance from mangrove swamps, which appear to be its exclusive breeding ground. It has a wide range of flight. Thus, it is a pest in the Western suburbs near the Parramatta River, at National Park, and on the Hawkesbury River, where it occurs in myriads, but is not seen in great numbers on the heights of Mosman or the North Shore Line. The mangrove swamp appear to be the basic factor in its distribution, and in the question of its control.

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* Reprinted from *The Australian Naturalist*, vi., 3, 37-42.

Aedes (*Finlaya*) *biocellatus* Taylor.—A very rare species described from the Hawkesbury River.

Aedes (*Finlaya*) *notoseriptus* Skuse.—A small species which may be confused with *A.* (*S.*) *argenteus* Poir., but differs inter alia in possessing a prominent white band on the proboscis. It is common during the summer in all types of country and not infrequently enters houses, but is rarely sufficiently abundant to be a pest. It bites at any time of the day or night and breeds principally in rock holes, but also in any small collection of water, including roof gutters and drains of houses.

Aedes (*Finlaya*) *alboannulatus* Macquart.—A widespread species. Larvæ are to be found principally in rock pools, but may also occur in swamps or in sublittoral rock pools; they are more often met with than those of any other species. Though common, this species is hardly ever seen biting except in shady gullies; it is not a pest.

Aedes (*Finlaya*) *occidentalis* Skuse (*queenslandis* Str. in Edwards paper).—Similar to the above, of which it is probably only a variety. It is rather less common and the larvæ have only been found in rock pools.

Aedes (*Finlaya*) *milsoni* Taylor.—Probably also only a variety of *A.* (*F.*) *alboannulatus* Macq.; it is relatively rare.

Aedes (*Finlaya*) *quasirubrithorax* Theobald.—A very rare species bred from larvæ taken at Wahroonga. Not previously recorded south of Queensland.

Aedes (*Pseudoskusea*) *concolor* Taylor.—A common species which is completely restricted to the sublittoral zone of sandstone. It bites occasionally by day but chiefly at dusk, when the females may be observed feeding on one in numbers, while the males hover and dance around in a cloud, awaiting them. The larvæ are only to be found in the sublittoral rock pools of varying salinity; they are usually the only forms present in this situation, but a few *A.* (*F.*) *alboannulatus* Macq. may occasionally also be seen. No explanation is at present available of this interesting strict limitation of both adult and early stages.

Lutzia halifaxii Theobald.—A useful species, since the adults do not suck blood while the larvæ devour other mosquito larvæ. It is not common in the area, but has been taken on the shale and the sandstone and once in a house.

Culex basicinctus Edwards.—This species has been found once at Muddy Creek in National Park; it has not been previously recorded south of Queensland.

Culex sitiens Wiedemann.—This species has been also taken once in the same locality as the above; Grafton was its previous most southern record.

Culex annulirostris Skuse.—A day-biting species which occurs not very commonly in the sandstone gullies. It breeds in any small collection of clear water.

Culex fatigans Wiedemann.—The domestic mosquito par excellence. It is dull brown in colour and without ornamentation. It bites only in the dark and is found practically exclusively in or near houses. It may be very numerous and annoying. It breeds in domestic collections of water and has a strong preference for polluted water, tins of liquid manure being among the most favoured situations. In Queensland and northern rivers of New South Wales this species transmits filariasis. It is the most economically and efficiently controllable of all the species.

Culex ?*cylindricus* Theobald.—An uncommon day-biting species which has been found in the sandstone gullies on the northern side of the harbour. (This may be the species recorded by Edwards as *C. fraudator* var. *annulata* Taylor).

Culex fergusoni Taylor.—Also uncommon. It has been taken in the creeks north of the harbour and on the Narrabeen shale at Waterfall in National Park. The larvæ of this species and of *C. cylindricus* Theo. are characterised by an exceedingly long and slender siphon.

Note.—*Aedes* (*Stegomyia*) *argenteus* Poiret (=*fasciata* Fabr.) definitely does not occur in the district. Its most southerly limit is Newcastle and, although it must have been introduced many times into Sydney, it has never established itself here, and it is probable that it never will. A similar phenomenon is seen at its northern limit in China.

For the identification, synonymy and systematic literature of the species the reader is referred to Edwards' valuable revision of the Australian Culicidae (*Bull. Ent. Res.*, xiv, 4, 351-401). Specimens of all the above species are available for comparison in the Macleay Museum, University of Sydney.

Control.

In considering the possible control of any group, definite and exact information must be available on a number of points before any action can be taken. These are: Firstly, what is the precise extent of the damage caused? Secondly, exactly which species require attention and which do not? Thirdly, a sufficient knowledge of the bionomics of the pest species must be available in order that control work may be carried out efficiently and inexpensively and in order that its probable cost may be accurately estimated. Finally, is the cost of control sufficiently low in proportion to the damage done to justify it being undertaken? In view of statements which have been made from time to time with regard to mosquito control, it is very necessary to examine each of these questions with considerable care.

Three mosquito-borne diseases occur in eastern Australia. Malaria is prevalent in certain districts north of Cairns, while sporadic cases have occurred as far south as Victoria. Filariasis is endemic throughout coastal Queensland and extends into the northern rivers of New South Wales; a single case was recorded from Camden in 1884. Dengue fever follows the distribution of *A.* (*S.*) *argenteus* Poir., which is apparently the only vector, and stops short at Newcastle. In Northern New South Wales and in Queensland, the reduction of filariasis and dengue by the control of domestic mosquitoes would undoubtedly be both a health and money saving proposition; in certain areas north of Cairns, the institution also of anti-malarial measures may be taken as indicated. In the Sydney district, however, it is quite another matter. Our mosquito-borne disease is limited to malaria, of which only two cases are definitely known to have occurred; at the very highest estimate it cannot be expected to exceed one case in every three or four years. Dengue and filariasis have never occurred here and there are no grounds whatever for the belief that they ever will, although the vector of the latter is present in considerable numbers. Mosquito-borne disease in this district then can only be considered as negligible from the point of view of the community as a whole. If, despite these facts, any action were contemplated, it would be much cheaper and probably more effective to compensate handsomely the very occasional sufferers from benign tertian malaria than to take action against *Anopheles annulipes* Walk.

There is another point of view to be considered; mosquitoes may be so numerous and annoying as to constitute a serious public nuisance and justify control measures on these grounds alone. This is the only question requiring serious consideration in the Sydney district. There is no doubt that mosquitoes are a source of annoyance, but there is room for considerable differences of opinion as to the amount of annoyance, depending on the susceptibility of the individual and the prevalence of mosquitoes in his own particular area. It is highly necessary to consider whether the cure may not be more vexatious than the disease, and, before anything is done, the cost of abating the nuisance and the inconvenience it will cause should be accurately estimated and the community asked to decide with a full knowledge of the facts whether any action is to be taken or not.

A study of the notes given above indicates clearly that the list of possibly dangerous or pest species is extremely short, the majority not being worth a moment's attention. The opinion has been expressed already that malaria is so insignificant that the control of *A. annulipes* Walk. need not be contemplated. If, however, it be considered desirable, it should be strictly limited to those isolated areas, Narrabeen for example, where this species is sufficiently common to be a possible source of danger. The two pest species in residential areas are *Culex fatigans* Wied. and *A.* (*O.*) *vigilax* Sk.; these far outweigh all others put together in their attentions on man; *A.* (*F.*) *natoseriptus* Sk. may be considered as a possible third. In areas where *A.* (*O.*) *vigilax* Sk. is prevalent it is distinctly a greater nuisance than *C. fatigans* Wied., and measures against the latter would not afford a great degree of relief. In the bush *A.* (*O.*) *vigilax* Sk. again is much the worst species, but *A.* (*Ps.*) *coneolor* Tayl. may annoy those who visit the rocky foreshores at dusk (the beaches are not badly infested with this species), *M. alternans* Westw. may worry campers on the Hawkesbury, while the Finlayas may occasionally be a slight annoyance, more particularly in the gullies. None of these, however, can be said to justify any great expenditure of energy or money and we may limit our discussion of control methods of *C. fatigans* Wied. and *A.* (*O.*) *vigilax* Sk.

Control measures may be directed either against the adults or against the larvæ. Against adults the only method of real value is the use of mosquito nets. These give a considerable degree of immunity from *C. fatigans* Wied. and should be in universal use wherever filariasis is endemic. They are inexpensive and have the advantage that each person is responsible for himself alone. Most repellents are inefficient and their use is highly dangerous in filaria infected localities, because they may enable one to get to sleep in comfort while not preventing bites later in the night. The usefulness of these methods in the area under consideration is limited, since probable more annoyance is caused through the attacks of *A.* (*O.*) *vigilax* Sk during the day and from both species before retiring than from *C. fatigans* Wied. later at night.

The first requisite of any anti-larval measures is that they should be strictly limited to and concentrated on, the important species. From this point of view a tabular statement of the different types of breeding grounds and the species found in them is of considerable interest,

HOUSEHOLD —*C. fatigans, A. notoscriptus*:

FRESH WATER ROCK HOLES —*An. stigmaticus, An. annulipes* (but rarely in numbers), *A. vittiger, A. flavifrons, A. notoseriptus, A. alboannulatus, A. occidentalis, A. milsoni, L. halifaxii, C. annulirostris, C. fergusoni.*

SWAMPS AND SOAKINGS.—*An. annulipes, A. venustipes, T. linealis, M. alternans, A. alboannulatus* (occasionally), *C. basicinctus, C. annulirostris, C. cylindricus.*

RUNNING WATER.—*An. annulipes, C. basicinetus.*

TREE HOLES.—*R. atripes, R. tasmaniensis. M. speciosus, A. notoscriptus.*

SUBLITTORAL ROCK POOLS.—*A. concolor, A. alboannulatus* (occasionally).

SALT MARSHES.—*A. vigilax, M. alternans.*

It will be apparent that the only breeding grounds worth attention are the household collections (including street drains and other collections of foul water in which *C. fatigans* may breed) and the salt marshes. All other types may for practical purposes be neglected; their treatment would make no perceptible impression on the mosquito nuisance. This is of special interest, since it is the rock pools and swamps which are the most obvious and the most likely to attract attention; further, they are frequently found to swarm with larvæ, which, however, on examination are found to be those of unimportant species. The necessity is obvious, not only of determining that larvæ are present in a given collection of water, but also of knowing to precisely what species they belong. A very interesting contrast is seen in respect of the relative importance of different types of breeding grounds between the Sydney district and those highly malarious tropical countries from which most of our knowledge of control is derived. Such American States as New Jersey supply practically the only parallel from which we may draw conclusions of much value. A word of warning against the blind acceptance of methods which are useful elsewhere, under totally different conditions, might not be out of place at this point.

Measures against *C. fatigans* Wied., the domestic species, include the removal of all old tins, &c., which may contain water, weekly emptying of all vessels in which water is kept, screening or oiling of all receptacles which cannot be emptied, attention to guttering, drains, &c., and such other procedures as may be indicated in special cases. Attention to polluted water is the prime consideration, other types are of very secondary importance. The co-operation of all the residents of an area is necessary and a central controlling and directing organisation, with trained sanitary inspectors and power to deal with delinquents, is essential. Sufficient money to carry out a campaign and to maintain operations once they have been initiated must be available. As indicated above, the use of nets gives a considerable degree of protection and it is questionable whether the not inconsiderable trouble and expense of anti-larval work would be justified.

The most satisfactory method of dealing with the salt marsh breeder, *A.* (*O.*) *vigilax* Sk. is by reclamation of the mangrove swamp areas, but draining in some cases or systematic oiling at appropriate times are also of value. Any of these methods would cost a very considerable sum of money. The value of the reclaimed land would possibly make the undertaking worth while in such well populated areas as the Parramatta River, but in purely holiday resorts the cost would be prohibitive.

With regard to the very few localities where the treatment of rock pools or swamps may be contemplated permanent drainage or filling are the only satisfactory methods, temporary or inefficient methods, such as oiling or stocking with fish being of doubtful utility and more expensive in the long run.

Finally, the house fly is a really serious pest and carrier of disease in the Sydney district, and the very definite opinion may be expressed that any money and energy which it is proposed to devote to mosquito control would be far more usefully and effectively employed in its reduction.

SUMMARY AND CONCLUSIONS.

1. A list of the mosquitoes of the Sydney district is given and their prevalence, habits, and distribution are indicated.
2. Mosquito-borne disease in the area is practically negligible.
3. The only prevalent pest species are the domestic *Culex fatigans* Wied. and the salt marsh *Aedes* (*Ochlerotatus*) *vigilax* Sk.
4. The control of domestic mosquitoes in northern New South Wales and in Queensland would be both a money and health saving proposition.
5. The only method of value against adults in the Sydney district is the use of mosquito nets.
6. It is very doubtful if anti-larval measures are justifiable in the Sydney district owing to their cost and inconvenience to householders. If undertaken, they should be strictly limited to domestic breeders and breeders in salt marshes.
7. Indiscriminate attack is strongly to be condemned and the efficiency and cost of any proposed measures should be accurately estimated before they are undertaken.
8. Caution should be exercised in adopting methods which have been found useful in other parts of the world, where conditions and types of breeding grounds requiring attention are quite different.
9. There is no justification for initiating measures against mosquitoes in the Sydney district, while the house fly, which is vastly more important, is allowed to thrive.

7.—TICK PARALYSIS IN MAN IN AUSTRALIA.

(I. M. MACKERRAS).

These notes were prepared in response to an enquiry by Dr. R. W. Cilento, Director of the Australian Institute of Tropical Medicine at Townsville. The time is particularly opportune for a résumé such as this, since the experimental work of Mr. I. Clunies Ross has made it possible to unify and co-ordinate previous descriptions and to give a connected account of the disease.

Definition.—An acute transitory motor paralysis caused by the bite of *Ixodes holocyclus* Neum. and ending within a few days in complete recovery or death.

Historical.—The earlier recorded cases in animals are those of Hovel (1824) and Backhouse (1843), while Joseph Bancroft (1884) appears to have been the first to record the occurrence of paralysis in man. Among more recent work, Eaton (1913) gives a particularly good clinical description and discussion of his case, though some of his speculations are not now tenable; Ferguson (1924) had reviewed all recorded deaths and studied the pathology of one fatal case in detail; Dodd (1921) proved that *Ixodes holocyclus* was definitely the cause of the paralysis in dogs. Lastly, Clunies Ross (1926) has carried out a most valuable and extensive experimental study of the disease in dogs. His work has placed our knowledge of the ætiology and of much of the pathology of the disease on a sound basis.

Aetiology.—*Ixodes holocyclus* is the proven causative agent in one case in man (Ferguson, 1924), and in many experimental cases in dogs (Dodd, 1921; Clunies Ross, 1926). In other human cases the circumstantial evidence incriminating this species is strong. Other species of tick cannot be definitely excluded, but it seems very improbable that they have any relation to human cases. Only the adult females are pathogenic, the males, nymphs and larvæ being quite without effect, though massive infection with the larvæ may produce constitutional disturbances of a less serious nature and different type (one of Cleland's cases apparently comes in this category).

Under optimum conditions the tick feeds slowly for about five days and then enters on a period of rapid engorgement lasting two to three days before leaving the host. This period is indicated by the rapid and great increase in size of the tick. With its commencement, the salivary glands enlarge greatly, and become extremely active. Cold or other adverse conditions may prolong the initial period of slow feeding up to two weeks or even more. The life history and biology of this tick have been fully described by Clunies Ross (1924); notes on the systematics are given by Ferguson (1923) and Fielding (1926).

Clunies Ross has definitely shown that the onset of symptoms coincides with, or follows shortly after, the commencement of the period of rapid engorgement, *i.e.*, five days or more after attachment of the tick. What little reliable evidence there is from human cases indicates that the same is true of them also. His evidence strongly favours the view that the disease is produced by a salivary toxin or venom of the tick rather than by a micro-organism or by a secretion-tissue reaction in the wound. An interesting and at present unexplained fact is that apparently not all specimens of *I. holocyclus* are toxic, even if allowed to remain on the host until engorgement is completed.

Distribution.—*I. holocyclus* is abundant throughout east coastal Australia and also occurs west of the Divide; it is not at present known whether or not it occurs in New Guinea and the adjacent islands. The recorded cases of tick paralysis fall within the limits of this distribution.

Age and Incidence.—No age appears to be exempt, but the disease is much more frequent and more serious in children than in adults. All the recorded deaths with one exception have been in children under the age of four, and in this case the age was given as thirteen or fourteen. There is no noteworthy difference in sex incidence.

Pathology.—Clunies Ross has brought forward evidence which strongly suggests that the poison has a specific affinity for the motor cells of the spinal cord and cranial nerve nuclei, producing in them more or less complete abrogation of function without noteworthy morphological changes. The autonomic nervous system appears to be somewhat hyper-irritable, as shown by the dilation of the pupil, the vomiting and the purging seen in various cases.

As would be expected from the transitory nature of the paralyses in those cases that recover, no gross disorganisation, or even clearly defined lesions, are found in the central nervous system. Sections of the cord and brain show some engorgement of the vessels and more or less round cell infiltration of the tissues. Numbers of new capillaries may be formed and numerous minute hæmorrhages were observed in the case studied by Ferguson (1924). No change can be made out in the nerve cells beyond an inconstsnt slight alteration of their staining properties. The cortex was unaffected in the experimental cases. No definite changes are to be found in other organs except pulmonary congestion due to the respiratory embarrassment. There is, of course, some inflammatory reaction at the site of attachment of the tick, but the extent of this has no relation to the disease.

Clinical Features.—The "incubation period" is five days or more after the attachment of the tick. Frequently the first symptom noticed is anorexia, the patient, though apparently in good health, refusing a meal. At the same time. or within a few hours, some unsteadiness in walking and inco-ordination of leg movements is observed. By the next day there is complete flaccid paralysis of the lower limbs with abolition of the reflexes. By the third day the arms show great weakness, and inco-ordination, and respiration becomes laboured, all the accessory muscles being brought into play, though weakly. The pupil is usually dilated, and may not react; the corneal reflex may be modified or abolished. Vomiting and purging may occur. The muscles of deglutition and speech may show paresis. In some cases there is initial mental irritability progressing to delirium and coma. A rise of temperature is frequently seen at some stage in the disease. Death is, in many cases at least, due to respiratory paralysis, the heart beating strongly to the end.

There is considerable variation in the intensity of the symptoms, some cases showing little more than a transitory paresis with inco-ordination of the lower limbs, with, perhaps, some dilation of the pupil or some vomiting or fever. Speaking generally, it appears that the younger the patient the more severe are the symptoms. This greater susceptibility of the young is possibly a function of the relation of body weight to the amount of toxin injected. There is also a good deal of variation in the predominating symptoms in different cases. In the case reported by St. Leger Moss (1924), for example, the eye symptoms were the most striking feature, little else being complained of beyond some weakness and pain in the legs. The cerebral symptoms, too, are inconstant, being well marked in some cases and apparently absent in others; they are apparently slight or absent in any but severe cases, a statement which applies also to the respiratory embarrassment. The most definite and constant feature of all cases is the interference with the muscular activity of the lower limbs, which may or may not progress to complete paralysis.

Death usually occurs on the fourth or fifth day, but may be later. In non-fatal cases the symptoms begin to abate about the same time, and in a few days the patient is perfectly well, and shows no sign of the really serious illness through which he has passed.

Diagnosis.—The sudden onset may suggest acute anterior poliomyelitis, and the two diseases have a number of features in common. The diagnosis depends on the recovery of the tick and the rapid progress to complete recovery in non-fatal cases of tick paralysis. The paralyses and motor disturbances have a much more extensive distribution in severe cases of tick paralysis than is usual in poliomyelitis. Hysterical paralyses may have to be excluded.

Prognosis.—It is not possible to obtain an accurate estimate of the mortality from the few cases hitherto recorded, but it appears to be fairly high. The prospect of recovery increases in general with the age of the patient. Respiratory or cerebral symptoms are of grave significance. The earlier the tick is discovered and removed the better is the outlook, though removal is not necessarily followed by arrest of the disease.

Treatment.—In suspected cases the whole body should be carefully searched for ticks, and all found should be removed at once. It is unwise to rest content with finding one tick—there may be others present which are causing the symptoms. It is sufficient to remove the body of the tick, leaving the rostrum embedded (it does no great harm), but it is better to dissect out the whole tick. Local treatment after removal of the tick does not appear to influence the disease.

The patient should be kept in bed on light diet and with plenty of fluid, if it can be taken. Eliminative treatment by the bowel, kidney, and skin may be tried, but should not be pushed so far as to reduce the patient's strength. The only treatment known which will affect the course of the disease is removal of the tick, and that is not always effective.

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[16 Graphs and 1 Map.]

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